

# Disease severity and quality of life in a follow-up study of patients with occupational contact dermatitis

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## Summary

**Background.** Few studies have investigated how occupational contact dermatitis and its severity affect patients' quality of life (QoL).

**Objectives.** To investigate the impact of occupational contact dermatitis and its severity on patients' QoL, and to examine the association between different QoL measures.

**Method.** Patients previously diagnosed with occupational contact dermatitis completed the Short Form Health Survey (SF-36) and Dermatology Life Quality Index (DLQI). Disease severity was rated both by the patient and by the physician.

**Results.** Of a possible 725, a total of 119 patients (16.4%) were included in the study, and, at follow-up, just over 21% had normal skin and 18.3% had progressed to persistent dermatitis. The SF-36 median physical component summary score was 52 [interquartile range (IQR): 43–56] and the mental component summary median score was 51 (IQR: 44–57). The correlation between patient-rated and physician-rated disease severity was moderate ( $r = 0.708$ ,  $p < 0.00001$ ). The correlation between the disease severity measures and DLQI was moderate, whereas the SF-36 correlated poorly with both the DLQI and disease severity measures.

**Conclusions.** QoL was generally reduced in this group of patients with occupational contact dermatitis, with some correlation between severity and DLQI. The DLQI was a more sensitive measurement of QoL than the SF-36 in this patient population. Incorporating disease severity rating with a QoL questionnaire is valuable in occupational contact dermatitis and is recommended.

**Key words:** allergic; dermatology life quality index; hand eczema; irritant; SF-36; skin disease; worker.

Occupational contact dermatitis has been defined as a pathological condition of the skin for which occupational exposure/s is shown to be a major cause or contributory factor (1). Occupational contact dermatitis is common,

and in many countries accounts for the majority of cases of occupational disease (2). The two most common types of occupational contact dermatitis are allergic contact dermatitis and irritant contact dermatitis. Allergic contact dermatitis is a delayed-type immunological reaction in response to contact with an allergen, and is diagnosed by patch testing, whereas irritant contact dermatitis results from contact with skin irritants such as wet work, soaps, detergents, oils, and solvents, and physical factors such as heat, sweating, and friction (2).

Although occupational contact dermatitis is not life-threatening, it can have a considerable physical and psychosocial impact (3). A number of studies

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have investigated the quality of life (QoL) in patients with occupational contact dermatitis (3–8), but the methodological limitations of some of these studies limits the ability to draw firm conclusions. Patients frequently complained of symptoms relating to their skin condition that also affected their mental state (3, 4, 6), and some described interference with work (4, 7) and daily activities (5, 8). Although all of these studies reported a reduced QoL in occupational contact dermatitis patients, inconsistencies occurred, largely because some studies used non-validated measures to assess QoL (7, 8). Among those that did use a validated measure, marked variations in the results were also seen, because the measures used differed between studies.

QoL can be assessed with a generic questionnaire, a dermatology-specific instrument, or a disease-specific instrument, singly or in combination. The use of both a generic and a dermatology-specific instrument is generally recommended (9, 10), especially where skin disease has a substantial general impact that is not evaluated by disease-specific instruments (10). Dermatology-specific instruments generally show moderate to good correlation with generic instruments (11–15), with some studies suggesting a better correlation with the mental than with the physical component of generic instrument (12, 13). However, none of the earlier studies has examined the correlations between these instruments specifically in occupational contact dermatitis patients.

The impact of occupational contact dermatitis might vary from one QoL aspect to another over time, and reduce as the skin condition improves. Optimally, assessment of QoL should occur over the course of the skin condition. In this study, we examined the correlation between two QoL measures in a cohort of patients with an initial diagnosis of occupational contact dermatitis, at the time of follow-up, and the correlation between QoL and disease severity as assessed by the physician and the patient, also at follow-up.

## Methods

### Subjects

Eligible study participants were diagnosed with occupational contact dermatitis at the Occupational Dermatology Clinic, Melbourne, Australia between January 1997 and December 2003. All were assessed by one occupational dermatologist (R.N.). This cohort of occupational contact dermatitis patients was followed up after a period ranging from 2 to 8 years. Participants who attended the follow-up clinic had an interviewer-administered questionnaire that included information regarding age at first

appointment, duration of dermatitis prior to initial assessment, duration of follow-up, personal and family history of atopy, initial diagnosis, and work relationship. Clinical assessment was performed by the same occupational dermatologist (R.N.) who had conducted the baseline assessment.

*Quality of life.* Study participants completed a generic questionnaire, the Short Form Health Survey (SF-36), and a dermatology-specific questionnaire, the Dermatology Life Quality Index (DLQI). The SF-36 consists of 36 questions covering eight health domains: general health perceptions, physical functioning, vitality, bodily pain, mental health, physical role functioning, emotional role functioning, and social role functioning (16). Missing data were assigned a score as directed in the SF-36 manual and interpretation guide (16). Higher scores indicate less impairment of QoL.

The DLQI (17) consists of 10 questions, each with four possible answers with a score from 0 to 3. The DLQI covers six categories: symptoms and feelings, daily activities, leisure, work/school, personal relationships, and treatment. A total score between 0 and 30 is derived by summing the responses to all questions. In contrast to the SF-36, a higher score indicates greater impairment of QoL.

*Disease severity.* Disease severity was assessed in three ways: self-report by the patient, report by the physician, and use of the Occupational Contact Dermatitis Disease Severity Index (ODDI) by the physician, initially and at follow-up (18, 19). The reliability and validity of the ODDI has been previously reported (18). The ODDI scores range from 1 (least severe) to 5 (most severe). As the ODDI was being developed during the time of the study, if patients had not already had an ODDI score assigned at the time of their initial clinic assessment, it was assigned retrospectively before the patient returned for follow-up. An analogue scale ranging from 0 (no dermatitis) to 10 (very bad dermatitis) was used to score patient-rated clinical severity, both at follow-up and at the time of worst disease, as well as to score physician-rated clinical severity at the time of follow-up.

### Statistical Analysis

The statistical package STATA™ (Version 9.0; StataCorp, College Station TX, USA) was used to perform all statistical analyses. A  $\chi^2$ -square test was used for binary data, and a *t*-test for normally distributed continuous data. A Mann–Whitney *U*-test was used to compare differences in scores where data had a non-parametric distribution. A *t*-test with unequal variance was used to compare the

SF-36 scores of patients with the Australian Population Norm. A Spearman's correlation coefficient computed the correlation between the SF-36, DLQI, ODDI, and severity as rated by physician and patient. A correlation greater than 0.8 was considered to be good, one between 0.5 and 0.8 was considered to be moderate, and one below 0.5 was considered to be poor (20). A two-sided  $p$ -value  $<0.05$  was considered to be statistically significant.

## Results

### Differences between responders and non-responders

In total, 725 patients were identified as being eligible for the study. Of these, 6 (0.8%) were deceased, 278 (38.3%) could not be located, 224 (30.9%) withdrew, and 217 (29.9%) agreed to take part. Of those who agreed to take part, 119 (16.4%) agreed to an appointment and attended the clinic, and 98 (13.5%) completed a telephone interview. The 119 who attended the clinical visit were the focus of this analysis.

Of the 119 participants who attended, 109 completed the QoL questionnaires (56 males and 53 females). Comparisons of the general characteristics of responders and non-responders are shown in Table 1. Responders were older at first appointment ( $p < 0.00001$ ) and had a longer disease duration ( $p = 0.006$ ) than non-responders. Responders were more likely to have a family history of eczema ( $p = 0.02$ ) or a personal history of hay fever ( $p = 0.03$ ). No differences were found in other characteristics.

### Demographic characteristics of responders at follow-up

The mean age at follow-up was 46.4 years (standard deviation  $\pm 13.6$  years) and participants were followed up after a mean period of 5.44 years (range: 2.9–10.0 years) (Table 2). Approximately 40% ( $n = 41$ ) of our responders had irritant or allergic contact dermatitis, and about 12.8% ( $n = 14$ ) had endogenous eczema. Seven (6.5%) others had either psoriasis or contact urticaria caused by latex. Twenty-three (21.1%) had reverted to normal skin, and 20 (18.3%) had progressed to persistent dermatitis. About one-third of the patients were healthcare workers, and majority of these were still working when followed up.

### QoL scores

A total of 109 patients completed the SF-36 questionnaire, and 104 completed the DLQI. Results for the SF-36 are shown in Table 3. For the SF-36, the median physical component summary score was 52 [interquartile range (IQR): 43–56], and the mental component summary

**Table 1.** Comparison of non-responders and responders at baseline

| Characteristics                              | Non-responders,<br>$n = 616$ (%) | Responders,<br>$n = 109$ (%) | $p$ -value         |
|----------------------------------------------|----------------------------------|------------------------------|--------------------|
| Sex                                          |                                  |                              |                    |
| Male                                         | 318 (51.6)                       | 56 (51.4)                    | 0.96               |
| Age at first appointment<br>(years) $\pm$ SD | 35.1 $\pm$ 12.0                  | 41.0 $\pm$ 13.4              | <b>&lt;0.00001</b> |
| Atopic                                       | 252 (40.9)                       | 55 (50.5)                    | 0.06               |
| Mean disease duration<br>(years) $\pm$ SD    | 1.80 $\pm$ 2.79                  | 2.69 $\pm$ 4.28              | <b>0.006</b>       |
| Personal history                             |                                  |                              |                    |
| Asthma                                       | 141 (22.9)                       | 27 (24.8)                    | 0.67               |
| Eczema                                       | 136 (22.1)                       | 28 (25.7)                    | 0.41               |
| Hay fever                                    | 194 (31.5)                       | 46 (42.2)                    | <b>0.03</b>        |
| Family history                               |                                  |                              |                    |
| Asthma                                       | 147 (23.9)                       | 23 (21.1)                    | 0.53               |
| Eczema                                       | 124 (20.1)                       | 33 (30.3)                    | <b>0.02</b>        |
| Hay fever                                    | 126 (20.5)                       | 19 (17.4)                    | 0.47               |
| Primary initial diagnosis                    |                                  |                              |                    |
| Irritant contact dermatitis                  | 280 (45.5)                       | 43 (39.5)                    | 0.49               |
| Allergic contact dermatitis                  | 201 (32.7)                       | 37 (33.9)                    | —                  |
| Endogenous eczema                            | 68 (11.1)                        | 18 (16.5)                    | —                  |
| Contact urticaria caused by latex            | 24 (3.9)                         | 4 (3.7)                      | —                  |
| Non-latex contact urticaria                  | 14 (2.3)                         | 4 (3.7)                      | —                  |
| Persistent occupational dermatitis           | 3 (0.5)                          | 1 (0.9)                      | —                  |
| Other                                        | 25 (4.1)                         | 2 (1.8)                      | —                  |
| Work relationship                            |                                  |                              |                    |
| Significantly                                | 489 (79.5)                       | 83 (76.2)                    | 0.45               |
| Partially                                    | 127 (20.6)                       | 26 (23.9)                    |                    |

SD, standard deviation; statistically significant results are shown in bold.

median score was 51 (IQR: 44–57). The scores in all domains in the SF-36 were comparable to the scores of the Australian Population Norm (21), except for the social functioning domain, where the score was significantly lower for the occupational contact dermatitis cohort ( $p = 0.03$ ). Males and females had similar scores in all dimension of the SF-36, except for the score for vitality and general health. Females reported better general health but had a worse vitality score than males. The difference in vitality scores between the sexes was significant ( $p = 0.04$ ).

The median DLQI score was 4.5 (IQR: 2.0–8) (Table 4). The domain with the highest score was symptoms and feelings, and that with the lowest score was treatment. There were no significant differences between males and females in DLQI scores. The relationship between disease severity and QoL is shown in Fig. 1. Higher disease severity is associated with low QoL in our cohort.

**Table 2.** Demographic characteristics of responders on follow-up

| Characteristic                           | n = 109         | %    |
|------------------------------------------|-----------------|------|
| Age at follow-up (years) (mean $\pm$ SD) | 46.4 $\pm$ 13.6 | —    |
| Years after follow-up (mean $\pm$ SD)    | 5.44 $\pm$ 1.84 | —    |
| Current diagnosis                        |                 |      |
| Normal skin                              | 23              | 21.1 |
| Irritant contact dermatitis              | 35              | 32.1 |
| Allergic contact dermatitis              | 6               | 5.5  |
| Endogenous eczema                        | 14              | 12.8 |
| Psoriasis                                | 4               | 3.7  |
| Contact urticaria caused by latex        | 3               | 2.8  |
| Non-latex contact urticaria              | 0               | 0    |
| Persistent occupational dermatitis       |                 |      |
| Persistent irritant contact dermatitis   | 6               | 5.5  |
| Persistent allergic contact dermatitis   | 10              | 9.2  |
| Persistent eczematous dermatitis         | 2               | 1.8  |
| Work-initiated eczema                    | 2               | 1.8  |
| Others                                   | 3               | 2.8  |
| Occupation                               |                 |      |
| Healthcare workers                       | 35              | 33.0 |
| Trades persons and labourers             | 28              | 26.4 |
| Process workers and packers              | 6               | 5.7  |
| Hair and beauty                          | 5               | 4.7  |
| Engineers                                | 4               | 3.8  |
| Food handlers                            | 4               | 3.8  |
| Others                                   | 27              | 24.8 |
| Currently working                        |                 |      |
| Yes                                      | 83              | 76.2 |
| No                                       | 25              | 22.9 |

SD, standard deviation.

**Disease severity scores**

The median ODDI score at baseline (Table 4) was 3 (IQR: 2–3), whereas, at follow-up, some improvement was seen, with a lower median ODDI score of 2 (IQR: 1–2). The median of the patient-rated disease severity score

**Table 4.** Dermatology Life Quality Index (DLQI), Occupational Contact Dermatitis Disease Severity Index (ODDI) and disease severity median scores

| Variables                          | Median scores (IQR) |
|------------------------------------|---------------------|
| Symptoms and feelings              | 2 (1–3)             |
| Daily activities                   | 1 (0–2)             |
| Leisure                            | 0 (0–1)             |
| Work/school                        | 1 (0–1)             |
| Personal relationship              | 0 (0–1)             |
| Treatment                          | 0 (0–1)             |
| Total DLQI (n = 104)               | 4.5 (2–8)           |
| Current diagnosis                  |                     |
| Normal skin                        | 1 (0–6)             |
| Irritant contact dermatitis        | 4.5 (3–8)           |
| Allergic contact dermatitis        | 4 (2–5)             |
| Endogenous eczema                  | 4 (2–9)             |
| Persistent occupational dermatitis | 9 (5–16)            |
| Disease severity (n = 109)         |                     |
| Baseline ODDI score                | 3 (2–3)             |
| ODDI score at follow-up            | 2 (1–2)             |
| Physician-rated                    | 1 (0–3)             |
| Patient self-rated                 | 2 (1–4)             |

IQR, interquartile range.

was 2 (IQR: 0–4), and the median of the physician-rated disease severity score was 1 (IQR: 0–3).

**Correlations**

The Spearman's rank correlation coefficient between the different measures is shown in Table 5. The SF-36 was negatively and poorly correlated with the DLQI and all measures of disease severity, although some correlations were statistically significant. Although the mental component summary of the SF-36 correlated better

**Table 3.** Short Form Health Survey (SF-36) median score (interquartile range) for the entire group and stratified by gender

| Variables                  | All (n = 109) | APN          | p-value*    | Males (n = 56) | Females (n = 53) | p-value†    |
|----------------------------|---------------|--------------|-------------|----------------|------------------|-------------|
| Physical functioning       | 95 (80–100)   | 95 (75–100)  | 0.24        | 95 (80–100)    | 90 (80–100)      | 0.27        |
| Role – physical            | 100 (50–100)  | 100 (75–100) | 0.11        | 100 (75–100)   | 100 (25–100)     | 0.41        |
| Bodily pain                | 82 (59–94)    | 84 (62–100)  | 0.21        | 82 (59–94)     | 82 (59–94)       | 0.32        |
| General health             | 72 (57–87)    | 77 (60–87)   | 0.54        | 72 (55–87)     | 77 (62–87)       | 0.41        |
| Vitality                   | 65 (50–80)    | 70 (53–80)   | 0.45        | 70 (50–80)     | 60 (50–70)       | <b>0.04</b> |
| Social functioning         | 88 (63–100)   | 100 (75–100) | <b>0.03</b> | 88 (75–100)    | 88 (63–100)      | 0.52        |
| Role-emotional             | 100 (67–100)  | 100 (67–100) | 0.77        | 100 (67–100)   | 100 (67–100)     | 0.83        |
| Mental health              | 80 (64–92)    | 80 (86–88)   | 0.90        | 80 (64–92)     | 78 (68–88)       | 0.60        |
| Component measures         |               |              |             |                |                  |             |
| Physical component summary | 52 (43–56)    | 53 (45–57)   | 0.51        | 53 (44–56)     | 51 (41–56)       | 0.37        |
| Mental component summary   | 51 (44–57)    | 53 (46–57)   | 0.53        | 52 (44–58)     | 51 (45–56)       | 0.56        |

APN, Australian Population Norms.

\*Comparing APN and this study group.

†Comparing males and females in this study group; statistically significant results are shown in bold.

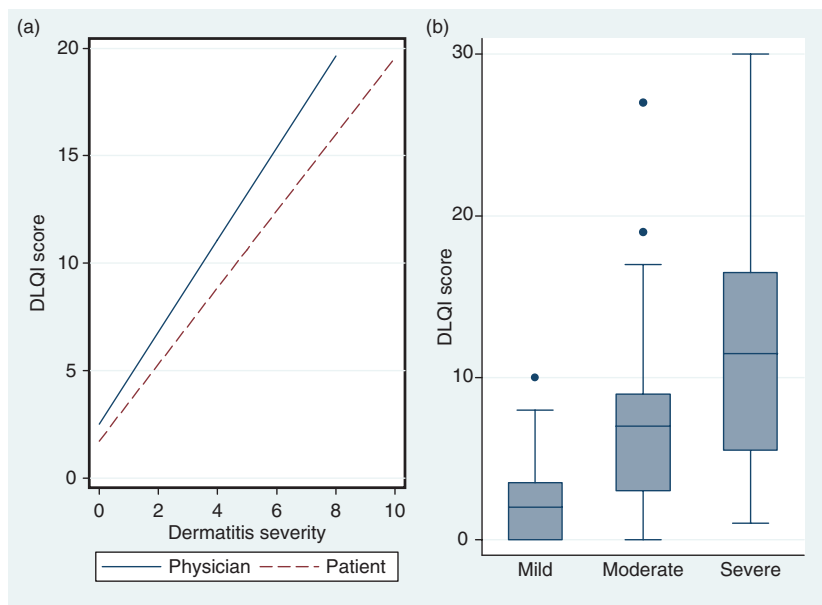


**Fig. 1.** (a) Dermatology Life Quality Index (DLQI) score plotted against disease severity as rated by physician and patient. (b) DLQI score as stratified by disease severity.

**Table 5.** Spearman's correlation coefficients between variables ( $p$ -value)

| Variables                | SF-36                      |                          | DLQI                          | Disease severity              |                               |
|--------------------------|----------------------------|--------------------------|-------------------------------|-------------------------------|-------------------------------|
|                          | Physical component summary | Mental component summary |                               | ODDI                          | Physician-rated               |
| SF-36                    |                            |                          |                               |                               |                               |
| Mental component summary | −0.0648 (0.50)             | —                        | —                             | —                             | —                             |
| DLQI                     | −0.2525 ( <b>0.01</b> )    | −0.2983 ( <b>0.002</b> ) | —                             | —                             | —                             |
| Disease severity         |                            |                          |                               |                               |                               |
| ODDI                     | −0.1077 (0.27)             | −0.1400 (0.15)           | 0.5749 ( <b>&lt;0.00001</b> ) | —                             | —                             |
| Physician-rated          | −0.0669 (0.49)             | −0.1116 (0.25)           | 0.5990 ( <b>&lt;0.00001</b> ) | 0.7875 ( <b>&lt;0.00001</b> ) | —                             |
| Patient-rated            | −0.1056 (0.27)             | −0.1575 (0.10)           | 0.6639 ( <b>&lt;0.00001</b> ) | 0.6401 ( <b>&lt;0.00001</b> ) | 0.7080 ( <b>&lt;0.00001</b> ) |

DLQI, Dermatology Life Quality Index; ODDI, Occupational Contact Dermatitis Disease Severity Index; SF-36, Short Form Health Survey; statistically significant results are shown in bold.

with all other measures than the physical component summary, the strength of correlations remained poor.

The DLQI had significant positive correlations with the ODDI and the physician and patient disease severity measures. Moderate correlation was seen between disease severity as perceived by physician and patient ( $r = 0.708$ ,  $p < 0.00001$ ) and the ODDI and physician-rated disease severity ( $r = 0.766$ ,  $p < 0.00001$ ).

## Discussion

In this follow-up study of 109 patients with occupational contact dermatitis, we found a small effect of occupational contact dermatitis on patients' QoL. A more significant impact was observed in the psychosocial aspect of life than in the physical aspect. Increased severity of disease was found to be associated with a poorer QoL. Overall, the correlation between the two QoL measures

was poor; however, there was good correlation between the patient-rated and physician-rated disease severity measures.

## QoL in occupational contact dermatitis patients

Our finding of a DLQI score of 4.5 (IQR: 2–8) suggests a small effect of occupational contact dermatitis on QoL in patients with occupational contact dermatitis, which is similar to findings of previous studies of occupational dermatitis. One study of occupational contact dermatitis patients reported a median DLQI score of 5 (IQR: 1–11) (4), whereas another study of occupational hand eczema found a DLQI score of 5.5 ( $\pm 4.8$ ) (6). However, the QoL in our cohort appeared to be better than in patients with other dermatological conditions, such as active atopic dermatitis (12, 13), acne (17), and psoriasis (14). The worse QoL in these conditions may be

attributable to more severe disease, a longer disease duration, the presence of concomitant diseases, and more continual disease. Temporary relief of occupational contact dermatitis often occurs when the patient is away from work for periods approximating a week or more, whereas in other skin conditions remissions are less predictable (4). Nevertheless, the DLQI scores in our cohort were still higher than those reported previously for healthy people without any dermatological conditions (12), a finding consistent with an effect of occupational contact dermatitis on QoL some 5 years after first presentation.

Overall, the SF-36 was not sensitive for the detection of impairment of QoL in this group of occupational contact dermatitis patients. The physical component summary of the SF-36 for this group was similar to that of the Australian Population Norm, a finding that was not unexpected, as dermatological conditions rarely interfere with physical functioning such as walking or dressing, which are the focus of the SF-36 physical functioning questions (2, 12). Many of our patients had improved over time and, in addition, may have adapted to their skin disease by employing coping strategies that reduced disease impact on their physical functioning (22). Also, our population might have been influenced by the healthy worker effect, as 75% of our cohort were still working and would have had, on average, better health than the general population.

Conversely, the mental component summary of the SF-36 was slightly lower than the Australian Population Norm. Previous studies have also found that the mental component summary is affected in dermatological conditions (11, 13, 14). Dermatological diseases often invoke negative emotions and result in reduced esteem (23). Anderson and Rajagopalan (24) found that soreness, itching and burning were highly prevalent in allergic contact dermatitis, and that patients often experienced anger and frustration about their skin diseases. Another study demonstrated that moderate to severe depression was strongly associated with low QoL in a group of patients with occupational hand eczema (6). Although the difference was not statistically significant, the mental component summary in our group was lower than the population norms, indicating an effect of occupational contact dermatitis on mental health.

This effect on mental health might also explain our finding of a significantly lower social functioning domain than in the Australian Population Norm ( $p = 0.03$ ). Patients with visible skin disease are particularly sensitive to the perception of others (23), and this often results in fear of stigma or rejection (25). For example, a previous study found that patients with moderate to severe psoriasis were asked to leave public places such as pools,

gymnasiums, and hairdressing salons (26). This resulted in avoidance of social situations such as meeting a friend or going to public places, for fear that rejection might occur (25).

We also found an association between higher disease severity and low QoL in our cohort, as shown in both patient and physician assessment of disease severity. Our findings are in agreement with previous studies (6, 12, 22, 27, 28) that found a positive association between low QoL and high disease severity.

### Correlations between the measures

The DLQI correlated poorly with both the physical and mental components of the SF-36. As in previous studies (12, 13), the DLQI was seen to have a slightly stronger correlation with the mental component summary than the physical component summary. This again suggests a greater impact of occupational contact dermatitis on the psychosocial and mental health aspects of QoL. The impact of a skin disease on QoL is usually more significant for the patient than the risk imposed by the disease itself, which could explain the low agreement.

In this study, the physician attempted to assess disease severity objectively with the ODDI, whereas the patient and physician also reported clinical severity. The ODDI is a tool used by the physician to assess both visible skin changes and functional impacts specific to occupational contact dermatitis, but allowing for fluctuation in disease activity, and thus provides a useful overall assessment of disease severity (18). We found a moderate and significant correlation between the ODDI and the DLQI. This is somewhat in contrast to previous studies (19, 28–31), which have shown that disease severity does not always correlate well with QoL measures. These earlier findings might have been influenced by the facts that the questionnaires used varied across the studies and that the patients generally required systemic treatment, suggesting more severe disease. We also found a good correlation between physician and patient assessment of clinical severity, countering earlier studies that reported weak agreement between patient and physician evaluation (31, 32).

We found that the SF-36 had a weak association with disease severity measures, as in previous studies that found poor correlations between generic QoL instruments and disease severity measures (12, 33). One explanation of the low correlation may be inconsistency in the assessment of disease severity. However, it appears that the DLQI is more sensitive in the assessment of QoL in occupational contact dermatitis than the SF-36 (9). Although the generic QoL instrument had a poor correlation with

disease severity measure, we do not promote the use of a single dermatology-specific instrument in assessment of QoL. The use of both a generic and a dermatology-specific instrument enabled assessment of QoL in a multidimensional manner.

A strength of our study is that all assessments were carried out by one occupational dermatologist, and inter-observer variability was therefore excluded. A limitation of our study is the high rate of loss to follow-up of the cohort. The non-responders were younger and had less severe disease at baseline, suggesting that the associations we have observed may be most applicable to those with more persistent severe disease. It is also possible that the results are biased towards more severe disease, as the patients had been referred to a tertiary clinic. However, we found that approximately 21% of patients in this study had reverted from occupational contact dermatitis to normal skin, and 37% of patients had no dermatitis when they came for follow-up. A possible limitation is that we used the dermatology-specific DLQI as a proxy for a disease-specific instrument. A disease-specific instrument that measures occupational contact dermatitis was not available at the time of the current study. However, the DLQI is simpler and shorter than other dermatology-specific measures (e.g. Skindex (34) and Dermatology-specific Quality

of Life (33)). It is also the most widely used dermatology-specific instrument (10).

## Conclusions

This is the first study to assess QoL in a cohort of occupational contact dermatitis patients followed up after approximately 5 years. QoL was generally reduced, and we found that occupational contact dermatitis had a greater impact on patients' psychosocial functioning than on their physical functioning, which highlights the potential long-term effect of occupational contact dermatitis on QoL. It is important for physicians to be aware of this, and perhaps to consider approaches to reduce the psychosocial impact of occupational contact dermatitis. Importantly, we found that physician rating of severity correlated well with patient assessment and with QoL, which suggests that physicians are well placed to assess the impact of occupational contact dermatitis on patients' well-being.

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