To Study Quality of Life in Hand Eczema Patients Using Skindex Score

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Authors’ contributions

This work was carried out in collaboration between all authors. Author SG designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author GK carried out study on patients, managed the literature searches and manuscript writing. Author AM managed the analyses of the study performed, and suggested appropriate modifications and also helped in many ways. All authors read and approved the final manuscript.

ABSTRACT

Background: Hand Dermatitis affects a significant portion of the population. The disease is severely distressing and has chronic course with negative impact on quality of life.

Aim: To evaluate the clinical profile and quality of life in hand eczema patients.

Materials and Methods: A total of hundred patients, clinically diagnosed as a case of Hand Eczema of different age and sex groups participated in this study. The patient’s quality of life was assessed by a self-administered questionnaire using skindex-16.

Results: It was seen that increased severity of the eczema might have become more tolerated with increasing age. Males had significantly more severe hand Eczema. The total skindex QoL mean score was 31.4. Of the three domains included in our study the symptoms domain was the most affected (mean percentage score 2.27), followed by emotional (mean 1.93) and functioning (mean 1.74). Responders reported being bothered most by itching, hurting due to skin condition, and hard to do work. After adjustment for potential confounders, poorer QoL was significantly associated with female gender (mean 31.45), unmarried group (mean 32.33), rural origin (mean 32.65) and increased severity of disease.

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long duration between 1-5 years (51%). Individuals who elected to change jobs because of their skin condition reported worse QoL.

**Conclusion:** We suggest that quality of life modification and emotional support should be included as a part of treatment for hand eczema. Educational programs are recommended for patients who are more vulnerable to having poorer QoL to prevent further impairment, as well as further studies of QoL in Indian patients for specific diseases using disease-specific instruments.

**Keywords:** Hand eczema; skindex-16; and quality of life.

1. **INTRODUCTION**

Skin diseases are a common health condition causing considerable disability. Patients with skin disease may experience severe symptoms, such as itching, pain, and discomfort that can have a profound psychological impact. The most common entity encountered in dermatology is Hand Eczema (HE), which affects 2%-9% of the general population [1]. A person handles several types of agents every day, so, contact dermatitis of hands is a common problem [2]. It is more common in women then men in ratio 2:1 [3]. About 80% of occupational related dermatoses affect the hands [1]. Its one year prevalence in general population has been assessed to be 9.7% [4]. The HE implies that the dermatitis is largely confined to the hands, with only minor involvement of other areas. Lesions on hand affect patients daily life. The chronic & relapsing nature of HE causes domestic, psychological, social & occupational undesirable outcomes. [5,6]. Other problems seen in HE patients are mood and sleep disorders, anxiety, low self-esteem and social phobia [5,7]. The treatment of HE primarily focuses on the severity of external lesions. Most physicians do not consider the impact of HE on patient's QoL or emotional well being [8].

Various dermatological conditions have a significant impact on Quality of Life (QOL) of patients but measurement of QOL is challenging. The concept of measuring QOL has been divided into several components including psychological, social and physical domains [8]. The QoL assessment tools most commonly applied to studying contact dermatitis patient populations include (1) Dermatology Life Quality Index, (2) The Dermatology-Specific QoL (DSQL), (3) The Family Dermatology Life Quality Index, (4) The Impact of Chronic Skin Disease on Daily Life, (5) Skindex [9].

Skindex is a widely used HRQoL instrument applicable to various skin diseases. Out of the above mentioned scales for assessing QoL in dermatological conditions the Skindex scale was used in our study [10]. So present study was carried out to undertake the clinical patterns of HE and to evaluate their QoL. Skindex -16 scale was used to assess the severity of disease.

2. **MATERIALS AND METHODS**

A total of hundred clinically diagnosed cases of HE in quiescent stage attending the out Patient Department of Dermatology at Maharishi Markandeswar Institute of Medical Sciences and Research, Mullana, Ambala (Haryana) were enrolled in the study. Patients with other dermatological disorders mimicking hand eczemas like psoriasis, tinea manuum & L.P & pregnant females were not included in study.

After recording the history of each patient in the proforma specially designed for the study including details like present complaints, duration and seasonal variation, medicaments used for pre-existing lesions, childhood eczema and atopy in self or family members, a thorough dermatological and systemic examination and needful investigations were carried out in all patients. The severity of HE was assessed by use of skindex-16 scale. The Skindex-16 questionnaire is simple and brief (16 questions) and focuses on three domains, i.e. a symptoms domain (questions 1–4), an emotional domain (questions 5–11), and a functional domain(questions 12–16). Survey responses were given as a likert scale from 0(never bothered) to 6 (always bothered). The scores for each domain were summed and the percent score was calculated.

The scale was translated to hindi and validated by back translation to English by two unbiased individuals separately. A higher score reflects a greater impact of skin disease.

2.1 Ethical Considerations

The study was carried out after approval by the institutional research and ethical committee. Analysis of data was done by SPSS software.
3. RESULTS

This study included 100 patients of HE with mean age 40.21 ±14.84 (17-77 years) and male to female ratio 1.6:1 (male=62, female=38). Descriptive characteristics of study population are reported in Table 2. The most common presentation in subjects was of Wear and Tear Dermatitis (30%) followed by Pompholyx and Figure tip eczema in 22% and 13% respectively. Maximum numbers of patients (51%) were having Disease duration between 1-5 years.

The mean of Skindex score was 31.3±13.7 on the skindex-16 scale and its domains with Age, Residence, Disease duration and Occupation was as described in Table 3. Out of the three domains of Skindex-16 scale, maximum mean score was observed in Symptom domains (2.24 ±1.10) followed by Emotion domain (1.90±1.01) and Functional domain (1.65±0.87).

The rural population was affected more in all three domains. The Emotional domain showed the most impairment in urban and rural (13.2±6.9 and 13.5±5.8).

The maximum of Skindex score was seen in age group of 11-15 years (seen in Table 4).
Table 3. Impact of hand eczema on different skindex-16 domains

| Age          | N  | Total score | Mean | SD | Total symptom | Mean | SD | Total emotion | Mean | SD | Total functioning | Mean | SD |
|--------------|----|-------------|------|----|---------------|------|----|---------------|------|----|-------------------|------|----|
| 15-25 yrs    | 22 | 33.7        | 14.5 | 8.8| 4.3           | 14.5 | 6.7| 10.4          | 5.3  |
| 26-35 yrs    | 20 | 29.4        | 16.4 | 8.4| 4.9           | 12.4 | 6.5| 8.6           | 5.9  |
| 36-45 yrs    | 25 | 32.6        | 13.8 | 9.4| 4.2           | 14.4 | 6.6| 8.8           | 4.8  |
| 46-55 yrs    | 18 | 31.6        | 13.1 | 9.7| 4.5           | 13.2 | 6.5| 8.7           | 4.1  |
| 56-65 yrs    | 8  | 29.9        | 9.1  | 8.3| 2.8           | 12.5 | 4.8| 9.1           | 3.3  |
| >65 yrs      | 7  | 25.4        | 7.9  | 8.1| 4.6           | 11.0 | 2.8| 7.7           | 2.2  |
| Total        | 100| 31.3        | 13.7 | 9.0| 4.3           | 13.4 | 6.2| 9.0           | 4.8  |

| Resident     |    |             |      |    |               |      |    |               |      |    |
|--------------|----|-------------|------|----|---------------|------|----|---------------|------|----|
| Urban        | 41 | 30.1        | 13.6 | 8.8| 3.9           | 13.2 | 6.9| 8.2           | 4.3  |
| Rural        | 59 | 32.1        | 13.7 | 9.1| 4.5           | 13.5 | 5.8| 9.6           | 5.0  |
| Total        | 100| 31.3        | 13.7 | 9.0| 4.3           | 13.4 | 6.2| 9.0           | 4.8  |

| Duration of disease | N  | Total score | Mean | SD | Total symptom | Mean | SD | Total emotion | Mean | SD | Total functioning | Mean | SD |
|---------------------|----|-------------|------|----|---------------|------|----|---------------|------|----|-------------------|------|----|
| Less than 1 yrs     | 36 | 28.9        | 11.8 | 8.3| 3.8           | 12.2 | 4.7| 8.5           | 4.5  |
| 1-5 yrs             | 51 | 32.0        | 15.3 | 9.1| 4.5           | 13.6 | 7.2| 9.5           | 5.2  |
| 5-10 yrs            | 5  | 30.2        | 13.0 | 9.2| 5.5           | 15.2 | 7.0| 5.8           | 2.6  |
| 11-15 yrs           | 5  | 39.0        | 10.3 | 9.8| 4.4           | 17.4 | 5.4| 11.8          | 2.7  |
| >15 yrs             | 3  | 35.7        | 8.1  | 13.0| 1.0           | 14.0 | 3.6| 8.7           | 4.0  |
| Total               | 100| 31.3        | 13.7 | 9.0| 4.3           | 13.4 | 6.2| 9.0           | 4.8  |

| Occupation         | N  | Total score | Mean | SD | Total symptom | Mean | SD | Total emotion | Mean | SD | Total functioning | Mean | SD |
|-------------------|----|-------------|------|----|---------------|------|----|---------------|------|----|-------------------|------|----|
| Cement worker     | 20 | 37.95       | 15.94 | 11.45| 4.51          | 15.10 | 7.65| 11.40         | 5.08 |
| Chemical          | 6  | 43.50       | 25.09 | 11.50| 8.85          | 21.75 | 11.79| 10.25         | 5.44 |
| Farmer            | 11 | 33.55       | 13.83 | 8.82| 4.53          | 15.18 | 5.90| 9.55          | 4.89 |
| Housewife         | 30 | 30.83       | 9.53  | 8.53| 3.38          | 13.10 | 4.66| 9.20          | 3.56 |
| Mechanic          | 11 | 29.64       | 11.17 | 8.73| 3.52          | 12.82 | 4.79| 8.09          | 6.14 |
| Other             | 22 | 24.59       | 11.90 | 7.41| 3.63          | 10.64 | 4.83| 7.05          | 4.55 |
| Total             | 100| 31.57       | 13.64 | 9.05| 4.3           | 13.51 | 6.23| 9.12          | 4.78 |

Table 4. Scoring as per scale items of skindex-16

| Domains            | Male (n=62) | Female (n=38) | Man-whitney | p value |
|--------------------|-------------|---------------|-------------|---------|
| Symptoms domain    | Mean        | SD            | Mean        | SD      |
| Itching            | 3.16        | 1.57          | 3.11        | 1.50    | 1161.00 | 0.902 |
| Burning            | 1.56        | 1.52          | 1.34        | 1.42    | 1080.00 | 0.472 |
| Hurting            | 2.42        | 1.17          | 2.29        | 1.33    | 1098.00 | 0.554 |
| Being Irritated    | 1.94        | 1.30          | 1.97        | 1.03    | 1132.00 | 0.735 |
| Emotional domain   | Mean        | SD            | Mean        | SD      |         |       |
| Persistence / reoccurrence | 2.05 | 1.19          | 1.58       | 0.72    | 916.50  | 0.051 |
| Worry              | 1.94        | 1.04          | 1.97        | 1.00    | 1163.50 | 0.913 |
| Appearance         | 2.02        | 0.97          | 1.92        | 1.00    | 1069.00 | 0.414 |
| Frustration        | 1.90        | 1.00          | 2.00        | 1.14    | 1127.50 | 0.924 |
| Embarrassment      | 1.89        | 1.11          | 1.97        | 1.10    | 1118.50 | 0.759 |
| Being annoyed      | 1.92        | 1.19          | 1.92        | 1.02    | 1173.50 | 0.973 |
| Feeling depressed  | 1.79        | 1.15          | 2.03        | 1.26    | 1088.00 | 0.505 |
| Functional domain  | Mean        | SD            | Mean        | SD      |         |       |
| Interactions with others | 1.52 | 1.16          | 1.71        | 1.16    | 1052.50 | 0.338 |
| desire to be with people | 1.44 | 1.08          | 1.74        | 1.03    | 958.50  | 0.098 |
| show affection     | 1.58        | 1.11          | 1.84        | 1.00    | 1011.00 | 0.213 |
| daily activities    | 2.11        | 1.40          | 2.00        | 1.01    | 1155.50 | 0.869 |
| work or what you do| 2.05        | 1.35          | 2.05        | 0.98    | 1144.50 | 0.806 |
| Symptoms           | 2.24        | 1.10          | 2.19        | 0.99    | 1148.50 | 0.833 |
| Emotion            | 1.94        | 0.94          | 1.89        | 0.89    | 1132.50 | 0.746 |
| Functioning        | 1.75        | 1.09          | 1.85        | 0.86    | 1066.50 | 0.427 |
Among various clinical presentations of HE, patients with Apron eczema showed maximum impairment whereas minimum impairment was seen in patients with pompholyx.

The Symptom that most commonly bothered the patients was itching (3.16±1.57)), followed by hurting (2.42±1.17). Persistence/reoccurrence was the Emotional problem that most commonly bothered the patients (2.05±1.19), followed by appearance (2.02±0.97). The effect on daily activity was the most common functional problem (2.11±1.40).

The social demographic status, which includes aggravating factors in Table 5, Seasonal variation of disease in Table 6 and different material in contact with patients hands in Table 7.

### Table 5. Aggravating factors

| Factor                      | Frequency | Percent |
|-----------------------------|-----------|---------|
| Cement                      | 9         | 9.0     |
| Chemical                    | 2         | 2.0     |
| Cow dung                    | 1         | 1.0     |
| Detergent                   | 7         | 7.0     |
| No material in contact      | 61        | 61.0    |
| Soap                        | 2         | 2.0     |
| Spirit                      | 1         | 1.0     |
| Sugarcane                   | 1         | 1.0     |
| Vegetables                  | 2         | 2.0     |
| Water                       | 1         | 1.0     |
| Cement/sand                 | 2         | 2.0     |
| Cleaning cloths             | 1         | 1.0     |
| Cow dung / fertilizer       | 1         | 1.0     |
| Grass, cement               | 1         | 1.0     |
| Pesticides / sugarcane      | 1         | 1.0     |
| Soap/ detergent             | 6         | 6.0     |
| Vegetables/detergent        | 1         | 1.0     |
| **Total**                   | **100**   | **100.0**|

### Table 6. Distribution of affect of change in season

| Season                        | Frequency | Percent |
|-------------------------------|-----------|---------|
| No seasonal variation         | 59        | 59.0    |
| Change in season              | 5         | 5.0     |
| Rainy                         | 1         | 1.0     |
| Rainy/winter                  | 1         | 1.0     |
| Summer                        | 12        | 12.0    |
| Summer/rainy                  | 1         | 1.0     |
| Summer/winter                 | 3         | 3.0     |
| Winter                        | 18        | 18.0    |
| **Total**                     | **100**   | **100.0**|

### Table 7. Distribution of contact material

| Material                      | Frequency | Percent |
|-------------------------------|-----------|---------|
| Detergent                     | 3         | 3.0     |
| Agriculture                   | 1         | 1.0     |
| Cement                        | 6         | 6.0     |
| Chalk                         | 1         | 1.0     |
| Chemical                      | 6         | 6.0     |
| Chunna (Lime)                 | 2         | 2.0     |
| Cow dung                      | 1         | 1.0     |
| Detergent                     | 25        | 25.0    |
| Dust                          | 2         | 2.0     |
| Electric work                 | 1         | 1.0     |
| Glue for tires                | 1         | 1.0     |
| Making sweat                  | 1         | 1.0     |
| Mixing cement                 | 1         | 1.0     |
| N work                        | 1         | 1.0     |
| Paper work                    | 1         | 1.0     |
| Petrol                        | 1         | 1.0     |
| Rubber                        | 2         | 2.0     |
| Social worker                 | 1         | 1.0     |
| Spirit                        | 1         | 1.0     |
| Student                       | 1         | 1.0     |
| Vegetables                    | 1         | 1.0     |
| Cement/sand                  | 5         | 5.0     |
| Cement/sand                  | 1         | 1.0     |
| Chalk/dust                    | 1         | 1.0     |
| Cow dung/fertilizer           | 4         | 4.0     |
| Cutting cloths pieces         | 1         | 1.0     |
| Cutting grass/fertilizer      | 1         | 1.0     |
| Cutting/vegetables            | 2         | 2.0     |
| Detergent/vegetables          | 4         | 4.0     |
| Diesel/farming               | 1         | 1.0     |
| Driving car/rubber            | 1         | 1.0     |
| Glue/heat                     | 1         | 1.0     |
| Gum/steal                     | 1         | 1.0     |
| Ink/stamp                     | 1         | 1.0     |
| Pesticides/cow dung           | 2         | 2.0     |
| Vegetables cut                | 1         | 1.0     |
| Vegetables/detergent          | 3         | 3.0     |
| Wires/electronic              | 1         | 1.0     |
| Wood/glue                     | 1         | 1.0     |
| Veg/cow dung                  | 1         | 1.0     |
| Cake/detergent                | 1         | 1.0     |
| Chunna (lime), chalk, chemicals | 1         | 1.0     |
| Detergent, soap, vegetable    | 1         | 1.0     |
| Ink/vegetable/detergent       | 1         | 1.0     |
| Mud/fertilizer/planting       | 1         | 1.0     |
| Veg/detergent/soap            | 1         | 1.0     |
| Cement/chunna                 | 2         | 2.0     |
| (lime)/sand                   |           |         |
| **Total**                     | **100**   | **100.0**|
4. DISCUSSION

HE is a common occupational dermatoses. It was first described in 19th century. Due to its high incidence and prevalence, it has enormous socio-economic consequences. Considering that many of the individuals do not seek medical care, true prevalence numbers are difficult to obtain. There is inadequate information about the QoL of HE patients. Additionally, the influence of HE on QoL has not been studied in Indian patients. HE is a skin disease of long duration that can negatively influence the life quality, social life and occupational options of patients [11]. The studies aimed at estimating the extent of their symptoms have been conducted mainly in developed countries. The QoL for patients with skin disease in developing countries has been a major problem because very few studies have been conducted on this topic and related issues have not been adequately addressed.

During recent years there has been increased interest in the burden of skin diseases in general and the impact on QoL specifically [12]. Patients' social and physical activities, including work, may be adversely affected because of reluctance to allow others to see their skin disease [13].

There are various HRQoL instrument applicable to various skin diseases [14-16]. Skindex is one of the instruments to measure the effects of skin disease on patient’s QoL [15]. Skindex-61 was developed in the mid-1990s [14]. The original version focused on skin diseases and the frequency and severity of their impact on QoL: cognitive effects, social effects, depression, fear, embarrassment, anger, physical discomfort, and physical limitations. The 29-item instrument improved upon the original questionnaire in its discriminative and evaluation capability and in administration time. Subsequently, the Skindex-29 questionnaire was reduced to a single-page instrument (Skindex-16) assessing how distressed patients were by the disease, as opposed to how frequently they experience effects of the disease [17]. Skindex-16 has subscales assessing distress related to Symptoms, Emotions, and Functioning and has been translated into 11 languages. Skindex-16 scale is a brief, single page version with fewer items and it measures the inconvenience rather than frequency of a patient’s experiences [13].

In the present study it was observed that patients of all age groups developed HE. Majority (45%) of the patients in the present study were in the 26-45 year age group. Similar findings were reported by Bajaj [18] who observed that most of the cases of HE (47.3%), were between age group 21-40 years. This may be because the capacity for sensitization is less in extremes of age and also may be due to the decreased occupational exposure to various allergens. [17]. Thus this study corroborates the findings of previous studies, which reported maximum
incidence in young adults and decreasing incidence with increase in age.

In the present study 62% were males, while remaining 38% were females, giving a male to female ratio of 1.6:1. In a study by Kishore NB et al. [19] men out numbered women by almost 1.21:1. In another study by Handa S et al. [4] also, the male patients out numbered female patients by 2:1. The majority of female HE patients in our study were housewives (n=30). In a similar study Suman and Reddy [20] and Kishore NB et al. [19] had observed that housewives formed the largest group of patients with occupational HE. This could be because they come in contact with variety of agents, which can act as irritants and allergens.

The standard of living varies from place to place. In our study most of patients belonged to poor socio-economic status (65%) and middle class (35%) which were higher when compared with the studies of Hald M et al. [21] (47.2%) and (40.4%) respectively. This could be attributed to poor and middle class being more exposed to allergens and to develop hand dermatitis [22]. The variation in reaction pattern in individuals to different antigens depends upon type of their occupation. It was observed that 30% of the patients had a wear and tear dermatitis type of morphological pattern. When compared to the study by Kishore NB et al. [19] wear and tear dermatitis was less frequent.

To the best of our knowledge this was the first study to use the modified Skindex -16 to show that HE has an appreciable effect on QoL. Several reports have indicated that contact dermatitis of hands negatively affect the ability to work and pursue normal daily activities [23].

The patients who suffered the maximum impairment in QoL were in the age group of 36-45 years. On Symptom scale the most common item that bothered the patients was itching (3.16), followed by hurting (2.42). Itching and hurting cause physical discomfort and inconvenience, these symptoms have been found to influence the personal and social lives of patients, as well as their daily functioning and psychological status [17]. The present study found significantly higher scores in the Symptom domain with increasing age.

In Urban areas nuclear families are more common with little interaction with other families or individuals. Thus they are neither aware nor concerned of each other’s medical problem. However in rural areas due to joint families and due to great bonding with other members of the society people are more inquisitive. They tend to enquire a lot about the individual’s disease. Thus this continuous questioning has a profound impact on patient’s mind. In the present study, patients of rural origin (n=59) had significantly higher Symptom scores with worse QoL [24].

Stress is common for just about everyone who deals with a job, family and responsibilities. Many stress symptoms are emotional, like excess worry and impaired concentration. But stress can manifest itself physically, too. Studies have shown that emotional stress, like a stressful career or relationship, can actually make HE worse. Anxiety is one of the most persistent causes of stress in a person’s life, so those living with anxiety may be prone to constant HE break outs. In our study males were more conscious of their appearance in public and persistence / reoccurrence. Therefore, even slight dermatological manifestations may cause distress. In contrast to other studies, this phenomenon may explain the significantly higher scores on the Emotional domain seen for males in our study. However, gender differences have not been consistent across all studies. This finding was similar to some international studies that did not find a major gender effect on QoL [25].

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In present study, on Emotional domain patients of rural origin (59) had poor QoL. Housewives (30) showed more emotional affect in our study. Other studies have reported that dermatological diseases on visible areas of the body caused more impairment in QoL, especially in women [17].

Several reports indicated that a job change exerted a beneficial effect on QoL, while others concluded that changing jobs had equivocal value or no impact what’s so ever [26,27]. The responders in our study who changed jobs because of ACD suffered greater QoL impairment than any other group analyzed [23]. Except for housewives, rest of the study population wanted to change their occupation due to impairment in Emotional domain. In the workplace, hands are important for both functionality and presentation. In occupations that require direct interaction with the public, such as food service and childcare, even noncontagious lesions of the hands are often viewed with suspicion and distaste [28].
Maximum functional impairment was seen in age group of 36-45 years (n=25). However, significant association between rural origin and poor QoL was evident only in the functional domain, which may reflect the uncertain access to medical care experienced by rural patients [17].

Hands were associated with significant impairment within the total functioning score and occupational impact scale. A significant association with higher scores on the Symptom domain (reflecting a higher physical burden on patients) and a significantly lower functional domain score (probably due to managing these comorbidities in ways that might have diminished the functional impact of the skin lesion) was found.

To the best of our knowledge, the present study was the first attempt for studying the QoL of Indian patients with HE and it was found much worse than what had been reported in diseases such as vitiligo, acne and melasma [29-31].

5. CONCLUSION

We conclude that increased severity of the eczema with no significant worsening of QoL indicates that HE might have become more acceptable and tolerated with increasing age. However, generally speaking, a poorer QoL was significantly associated with male gender, older age, rural origin, a shorter duration of lesion (less than 6 months) and generalized spread.

We suggest that QoL modification and emotional support should be included as a part of treatment for HE. Educational programs are recommended for patients who are more vulnerable to having poorer QoL to prevent further impairment. We recommend further studies of QoL in Indian patients for specific diseases using disease-specific instruments.

CONSENT

This is not an invasive study. In this study a paper based questioner is used. However, Consent of every patient was taken in written in vernacular language.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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