

Clinical and Epidemiological Profile of Hand Eczema Among Patients Attending A Tertiary Care Hospital in North Karnataka: A Cross-Sectional Study

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Date of Submission: 22-06-2026

Date of Review: 27-06-2026

Date of Acceptance: 02-08-2026

ABSTRACT

Background: Hand eczema is a common inflammatory dermatosis influenced by endogenous susceptibility and environmental exposures. Its clinical and occupational patterns may vary across geographical and occupational settings. **Methods:** A hospital-based descriptive cross-sectional study was conducted among 100 patients with clinically diagnosed hand eczema from January to August 2024. Sociodemographic characteristics, occupational exposures, clinical features, aggravating factors, and associated dermatological conditions were recorded. Data were summarised using frequencies and percentages, and exploratory sex-wise comparisons were performed using appropriate statistical tests. **Results:** More than half of the patients were aged 31–45 years (56%), and 55% were men. Manual labourers formed the largest occupational group (28%), and occupational exposure was reported by 76%. Itching (90%) was the predominant symptom and erythema (80%) the most common morphological feature. Palmar involvement was recorded in 75%, bilateral disease in 60%, and chronic disease lasting >6 months in 45%. A history of atopy was reported by 54% of study population. **Conclusion:** Hand eczema was commonly associated with occupational exposure and predominantly affected adults in the working-age group. The high proportion of chronic disease and reported exposure-related factors indicates the need for greater attention to occupational and environmental factors during clinical assessment.

KEYWORDS: Hand eczema; Occupational exposure; Chronic hand eczema; Atopy; Wet-work; Dermatitis

INTRODUCTION

Hand eczema is one of the most common inflammatory dermatoses, with an estimated one-year prevalence of about 9% and a point prevalence of about 4% in the general population^[1]. In many patients, it follows a chronic and relapsing course and constitutes an important occupational skin disease^[2, 3]. It can impair work capacity, daily activities, and quality of life, resulting in considerable economic and psychosocial burden^[2, 4].

Hand eczema is a heterogeneous condition influenced by both endogenous susceptibility and exogenous exposures. Aetiologically, it may be related to irritant contact dermatitis, allergic contact dermatitis, atopic predisposition, or a combination of these factors^[2, 5]. Clinically, it may present with different and overlapping morphological features, making classification based on aetiology or clinical presentation difficult in some patients^[2, 6]. Repeated exposure to water, detergents, chemicals, cement, and other occupational irritants can impair the epidermal barrier and promote cutaneous inflammation. Wet-work is particularly important in occupational hand eczema and is associated with an increased risk in several occupations involving frequent exposure to water and irritants^[3].

Indian hospital-based studies have reported considerable variation in the occupational and clinical patterns of hand eczema^[7, 8]. Male predominance has been reported in some studies, possibly reflecting greater exposure to outdoor and manual occupations,^[2-3, 9] whereas other studies have highlighted the contribution of domestic wet-work among women^[3, 10]. These patterns may vary according to local climate, occupation, agricultural and industrial practices, and socioeconomic conditions. However, clinico-epidemiological data on hand eczema from North Karnataka are limited. Region-specific data may help identify common clinical patterns and occupational exposures and guide appropriate preventive counselling.

The present study was therefore undertaken to describe the clinico-epidemiological profile of patients with hand eczema attending a tertiary care hospital in North Karnataka, with particular reference to their sociodemographic characteristics, occupational exposures, clinical features, aggravating factors, and associated dermatological conditions.

MATERIALS AND METHODS

Study design and setting: This hospital-based, descriptive cross-sectional study was conducted in the Department of Dermatology, Faculty of Medical Sciences, KBN University, Kalaburagi, Karnataka, over a period of eight months from January to August 2024. Patients with hand eczema attending the dermatology outpatient department during the study period were included.

Study participants: A total of 100 patients of either sex clinically diagnosed with hand eczema were enrolled by consecutive sampling. Patients in whom hand involvement occurred as part of widespread eczema, immunocompromised patients, those receiving immunosuppressive therapy, and patients with malignancy were excluded. No formal sample size calculation was performed.

Ethical Approval: The study was approved by the Institutional Ethics Committee of the institution. Written informed consent was obtained from the participants before enrolment, and confidentiality of participant information was maintained.

Data collection and clinical assessment: Data were collected using a structured proforma. Information regarding age, sex, occupation, disease duration, presenting symptoms, relevant exposures, aggravating factors, history of atopy, and previous treatment was recorded. Occupational exposure, seasonal aggravation, use of cosmetics or detergents, and aggravation related to sweating or humidity were recorded on the basis of the history provided by the patient.

A detailed clinical examination of both hands was performed. Morphological features, including erythema, vesicles, scaling, papules, oozing, and fissuring, were recorded. The anatomical distribution of lesions (palmar, dorsal, or mixed), laterality (unilateral or bilateral), and associated dermatological conditions were also documented. Disease duration was categorised as acute (<6 weeks), subacute (6 weeks to 6 months), or chronic (>6 months).

The diagnosis of hand eczema was based on clinical history and examination. Patch testing was not performed; therefore, aetiological classification into allergic and irritant contact dermatitis was not attempted. Disease severity was not assessed using a validated severity scoring system.

Statistical analysis: Data were analysed using IBM SPSS Statistics for Windows, version 25.0. Categorical variables were summarised as frequencies and percentages. Associations between sex and associated dermatological conditions were assessed using the chi-square test or Fisher's exact test, as appropriate. A two-sided *p* value <0.05 was considered statistically significant.

RESULTS

100 patients with clinically diagnosed hand eczema were included. There was a slight male predominance (55.0%), and more than half of the patients were aged 31–45 years (56.0%). Manual labourers constituted the largest occupational group (28.0%) [Table. 1].

Characteristic	Category	Percentage (95% CI)
Sex	Male	55.0 (45.2–64.4)
	Female	45.0 (35.6–54.8)
Age (years)	15–30	24.0 (16.7–33.2)
	31–45	56.0 (46.2–65.3)
	46–60	15.0 (9.3–23.3)
	>60	5.0 (2.2–11.2)
Occupation	Manual labourer	28.0 (20.1–37.5)
	Household worker	20.0 (13.3–28.9)
	Office staff	19.0 (12.5–27.8)
	Student	16.0 (10.1–24.4)
	Others	17.0 (10.9–25.5)

Table 1: Sociodemographic characteristics of patients with hand eczema (N=100)

Itching was the predominant symptom (90.0%), while erythema was the most common morphological feature (80.0%). Palmar involvement was frequently recorded (75.0%), and bilateral involvement was present in 60.0% of patients. Chronic disease lasting more than six months was the most frequent duration category (45.0%) [Table. 2].

Occupational exposure was the most frequently reported exposure-related factor (76.0%). A history of atopy was

reported by more than half of the patients (54.0%), while seasonal aggravation, cosmetic or detergent exposure, and sweating or humidity were also commonly reported [Table. 3].

Characteristic	Category	Percentage (95% CI)
Symptoms*	Itching	90.0 (82.6–94.5)
	Burning	60.0 (50.2–69.1)
	Pain	40.0 (30.9–49.8)
Morphological features*	Erythema	80.0 (71.1–86.7)
	Vesicles	75.0 (65.7–82.5)
	Scaling	75.0 (65.7–82.5)
	Papules	70.0 (60.4–78.1)
	Oozing	60.0 (50.2–69.1)
	Fissuring	55.0 (45.2–64.4)
	Palmar	75.0 (65.7–82.5)
Anatomical distribution*	Mixed	45.0 (35.6–54.8)
	Dorsal	15.0 (9.3–23.3)
	Other	10.0 (5.5–17.4)
	Bilateral	60.0 (50.2–69.1)
Laterality	Unilateral	40.0 (30.9–49.8)
	Acute (<6 weeks)	22.0 (15.0–31.1)
Duration	Subacute (6 weeks–6 months)	33.0 (24.6–42.7)
	Chronic (>6 months)	45.0 (35.6–54.8)

Table 2: Clinical characteristics of patients with hand eczema (N=100)

*Multiple responses or overlapping clinical findings were recorded; therefore, percentages may exceed 100%.

Factor	Percentage (95% CI)
Occupational exposure	76.0 (66.8–83.3)
History of atopy	54.0 (44.3–63.4)
Seasonal aggravation	48.0 (38.5–57.7)
Cosmetic/detergent exposure	44.0 (34.7–53.8)
Sweating/humidity	36.0 (27.3–45.8)

Table 3: Reported predisposing, exposure-related, and aggravating factors among patients with hand eczema (N=100)

Multiple factors could be reported by the same patient; therefore, percentages do not total 100%.

Tinea cruris was the most frequently recorded coexisting dermatological condition (55.0%), followed by keratoderma (33.0%) and psoriasis vulgaris (30.0%). In

exploratory sex-wise analysis, tinea cruris was more frequent among men (72.7% vs 33.3%; $p<0.001$), whereas psoriasis vulgaris was more frequent among women (44.4% vs 18.2%; $p=0.009$). No significant sex-wise differences were observed for the other conditions [Table. 4].

Condition	Male (n=55), n (%)	Female (n=45), n (%)	Total, % (95% CI)	p value
Keratoderma	20 (36.4)	13 (28.9)	33.0 (24.6–42.7)	0.564
Tinea cruris	40 (72.7)	15 (33.3)	55.0 (45.2–64.4)	<0.001
Psoriasis vulgaris	10 (18.2)	20 (44.4)	30.0 (21.9–39.6)	0.009
Lichen planus	14 (25.5)	6 (13.3)	20.0 (13.3–28.9)	0.209
Scabies	7 (12.7)	5 (11.1)	12.0 (7.0–19.8)	1.000
Vitiligo	7 (12.7)	3 (6.7)	10.0 (5.5–17.4)	0.505

Table 4: Coexisting dermatological conditions according to sex (N=100)

Percentages in the male and female columns were calculated using the respective sex-specific denominators. Comparisons were exploratory. Chi-square test with Yates continuity correction was used; Fisher's exact test was used where an expected cell count was <5.

DISCUSSION

The present study showed that hand eczema predominantly affected adults in the working-age group, with 56% of patients aged 31–45 years and a slight male predominance (55%). Previous studies have reported variation in age and sex distribution depending on the population studied and occupational exposure^[7–10]. A similar working-age predominance was reported by Siddiqui et al. among lock-making workers, where 41.5% were aged 36–40 years and 80% were men^[11]. Handa et al. also reported an approximately two-fold male predominance in their hospital-based study^[7]. The comparatively lower male predominance in the present study may reflect its broader clinical population, which included both occupational groups and household workers.

Occupational exposure was reported by 76% of patients, and manual labourers formed the largest occupational group (28%). This is consistent with the recognised association of hand eczema with repeated exposure to water, detergents, chemicals, cement, friction, and other irritants^[2, 3]. Zeerak et al. identified hand eczema in 46 (13.5%) of 340 hospital employees screened^[8]. Siddiqui et al. reported a considerable disease burden among lock-making workers exposed to multiple workplace agents^[11]. A recent systematic review among healthcare workers

further supports the association with occupations involving frequent wet-work^[12]. These findings indicate that the occupational profile varies across work settings, but repeated workplace exposure remains an important factor.

A history of atopy was reported by 54% of patients. Atopic predisposition is an established risk factor and may increase susceptibility to irritant exposure^[2, 5]. Handa *et al.* found that pompholyx was significantly associated with atopic status ($p=0.004$), although overall disease severity did not differ significantly between atopic and non-atopic patients^[7]. Seasonal aggravation was reported by 48%, cosmetic or detergent exposure by 44%, and sweating or humidity by 36%. These findings suggest that endogenous susceptibility and external exposures frequently coexist, although the relative contribution of individual factors could not be determined.

Itching was the predominant symptom (90%), while erythema was the most common morphological feature (80%). Vesicles and scaling were each present in 75%, followed by papules (70%), oozing (60%), and fissuring (55%). Considerable variation in morphology has also been reported in previous studies. Handa *et al.* found that 62% of patients could not be assigned a definite morphological subtype, while pompholyx was the most frequent defined pattern (14%)^[7]. Zeerak *et al.* reported wear-and-tear dermatitis as the most common pattern (36.9%) among hospital employees^[8]. These differences may partly be due to differences in classification, as the present study recorded individual morphological features rather than mutually exclusive subtypes. Palmar involvement was recorded in 75% and bilateral disease in 60%. Differences in distribution may reflect the type and site of exposure, underlying aetiology, and clinical phenotype^[2, 6, 13].

Chronic disease lasting more than six months was present in 45% of patients. In the Dutch Lifelines study of 57,798 adults, Voorberg *et al.* reported a one-year prevalence of 7.3%, of whom 4.7% had chronic disease^[14]. Another large population-based study found that 82.6% of individuals with eczema during the preceding year fulfilled the criteria for chronic hand eczema and reported poorer health and more sick leave^[4]. Although these population-based findings are not directly comparable with the present hospital-based study, they highlight the chronic and recurrent nature of the disease.

The impact of persistent disease on work and daily activities is particularly relevant in occupational settings. Siddiqui *et al.* assessed severity and quality of life among lock-making workers using the Hand Eczema Severity Index and Dermatology Life Quality Index and reported an adverse impact on quality of life^[11]. This is relevant to the

present study, where most patients were of working age and occupational exposure was frequently reported. Identification of relevant workplace exposures and appropriate preventive measures may help reduce persistence and work-related impairment.

Tinea cruris was the most frequently recorded coexisting dermatological condition (55%), followed by keratoderma (33%) and psoriasis vulgaris (30%). In exploratory analysis, tinea cruris was more frequent among men (72.7% vs 33.3%), whereas psoriasis vulgaris was more frequent among women (44.4% vs 18.2%). Comparable data on these coexisting conditions are limited. Moreover, psoriasis vulgaris and hyperkeratotic hand eczema may show considerable clinical overlap, making differentiation on clinical examination difficult in some patients^[5, 13]. The observed sex differences should be interpreted cautiously because of the small sample and multiple exploratory comparisons.

A detailed occupational and exposure history is therefore important, particularly among manual labourers and those involved in frequent wet-work. Reduction of avoidable irritant exposure, appropriate hand protection, regular use of emollients, and skin-care education remain important preventive measures^[2, 3]. Patch testing may help identify contact sensitisation in persistent or recurrent cases where allergic contact dermatitis is suspected^[2, 15]. Handa *et al.* reported at least one positive patch-test reaction in 65% of patients,^[7] compared with 32.6% among hospital employees by Zeerak *et al.*^[8]. As patch testing was not performed in the present study, further aetiological classification was not possible.

This study has some limitations. It was conducted at a single tertiary care centre with a relatively small sample, limiting generalisability. Occupational and aggravating exposures were based on patient-reported history and could not be quantified. Patch testing was not performed, preventing differentiation between allergic and irritant causes. Disease severity was not assessed using a validated scoring system, and detailed characterisation of atopic history and individual exposures was unavailable. The anatomical distribution categories were overlapping and could not be interpreted as distinct clinical subtypes. The sex-wise comparisons of coexisting dermatological conditions were exploratory and should be interpreted cautiously because of the small sample and multiple comparisons.

CONCLUSION

Hand eczema in this study was more frequent among working-age adults, with occupational exposure reported by three-fourths of patients. Manual labourers were the most commonly affected occupational group, and chronic

disease was present in nearly half of the patients. The frequent occurrence of atopy and exposure-related aggravating factors indicates the need for identifying individual triggers and modifying avoidable occupational and household exposures as part of routine management.

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How to cite this article: Ansari H, Batul S, Kauser SH, Melkundi KR, K. Clinical and Epidemiological Profile of Hand Eczema Among Patients Attending A Tertiary Care Hospital in North Karnataka: A Cross-Sectional Study. *Perspectives in Medical Research* 2026; 14(2):27-31 DOI: [10.47799/pimr.1402.26.86](https://doi.org/10.47799/pimr.1402.26.86)