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IMPACT OF HYPERKERATOTIC PALMOPLANTAR DERMATOSES ON DERMATOLOGY LIFE QUALITY INDEX, IN A TERTIARY CARE CENTRE IN EASTERN INDIA: A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background:
Palmoplantar dermatoses viz., palmoplantar psoriasis (PPP), hyperkeratotic hand foot eczema (HHFE), and palmoplantar keratoderma (PPK) are the common concern in dermatology as being chronic nature of the dermatoses. Furthermore, they are recalcitrant to treatment and cause significant impairment in quality of life. Early diagnosis and prompt treatment help in improving the quality of life of a patient.
Aim: To study the impact of hyperkeratotic palmoplantar dermatoses on quality of life.

Materials and methods:
A cross-sectional study was conducted. Patients of either sex, over 16 years of age presenting with hyperkeratotic lesions on palms and soles who were clinically diagnosed as palmoplantar psoriasis, hyperkeratotic hand foot eczema, palmoplantar keratoderma those were not under any topical or systemic medication within past 1 month were enrolled in the study. Quality of life was assessed by the Dermatology Life Quality Index (DLQI) questionnaire.

Results:
One hundred fifty-one patients were enrolled, of which 83 (55%) were males and 68 (45%) were females. palmoplantar psoriasis was the most common dermatosis with 74 (49%) patients, followed by hyperkeratotic hand foot eczema with 45(30%) patients and palmoplantar keratoderma with 32(21%) patients. Farmers and housewives were the most affected occupational group. The mean DLQI was maximum in hyperkeratotic hand foot eczema (13.31) followed by PPP (12.08) and PPK (9.15) being the lowest. The most common symptoms affected were feeling and work-related disability.

Conclusion:
Chronic palmoplantar dermatoses have significant impairment in quality of life.

Recommendations:
Early diagnosis and treatment of hyperkeratotic palmoplantar dermatoses, like PPP, HHFE, and PPK, are essential for improving quality of life. Using the Dermatology Life Quality Index routinely helps create personalized treatment plans and enhances patient outcomes.

Keywords: *Dermatology Life Quality Index, quality of life, hyperkeratotic, palmoplantar dermatoses*
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INTRODUCTION

Palms and soles have non-hairy skin marked by ridges and grooves unique to everyone, known as dermatoglyphics.[1] Palmoplantar dermatoses are skin conditions that affect the skin of the palms and soles, causing significant discomfort and embarrassment to patients due to their location and interference with daily activities.[2]

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Palmoplantar dermatoses are a common concern in dermatology as they affect visible areas of the body.[3] Palms and soles are involved in almost all daily activities, exposed to various allergens, infectious agents, friction, and mechanical trauma more frequently than other body parts of the body.[4]

Palmoplantar psoriasis (PPP), hyperkeratotic hand and feet eczema (HHFE), and palmoplantar keratoderma (PPK) are chronic skin conditions that are difficult to treat, require regular follow-ups and expensive medications. They can also negatively impact work-related and daily activities.[3]

PPP is a localized form of psoriasis that is characterized by well-demarcated and symmetrically distributed erythematous plaques with silvery scales on palms and soles with involvement of thenar and hypothenar eminences, knuckles of hands insteps of feet. There can be coarse nail pitting.[5] It can be exacerbated by seasonal changes, detergents, and householdwork, and is more common in farmers, manual laborers, and housewives.[6]

HHFE is a skin condition that causes thick scales to form on the palms and soles of the feet, as well as the fingers. The condition is caused by a combination of endogenous and exogenous factors. Exogenous factors include repeated exposure to irritants and friction.[7,8] Patients with HHFE likely have a pre-existing skin barrier dysfunction, which can lead to secondary immune dysregulation due to irritants and friction.[9]

The risk factors for eczema are wet work, atopy, and contact allergy. It can become a chronic condition with persistent disease even after removal of allergens. The prevalence is higher in young females.[10] Palmoplantar keratodermas (PPK) are a group of disorders that are characterized by thickening of the skin on the palms and soles. These disorders can either be inherited or acquired, and the diagnosis is based on the presence or absence of hyperhidrosis, erythematous borders, and systemic involvement. Family history plays an important role in diagnosis. Acquired PPK typically develops later in life and can have various underlying causes, including infections, drugs, inflammatory and reactive dermatoses, systemic diseases, and internal malignancy.[11]

This study aimed to assess the impact of hyperkeratotic palmoplantar dermatoses on the quality of life of patients.

MATERIALS AND METHODS

Study design

An institution-based cross-sectional observational study.

Study setting

The study was conducted in the outpatient department of Dermatology, M.G.M. Medical College & L.S.K. Hospital, Kishanganj, Bihar after approval of the Institutional ethics committee of the institute. This is a tertiary care hospital that caters to the population of Bihar and adjacent areas of West Bengal. The study was conducted over 1 year during the period from January 2023 to December 2023.

Participants

All consecutive patients attending the DVL OPD of the above-mentioned college presenting with hyperkeratotic palmoplantar dermatoses like Palmoplantar psoriasis (PPP), Hyperkeratotic hand and feet eczema (HHFE), and Palmoplantar keratoderma were recruited in the study by the inclusion and exclusion criteria mentioned below and were evaluated.

Inclusion criteria

Patients of either sex, over 16 years of age, presenting with hyperkeratotic lesions on their palms and soles, were clinically diagnosed as having either PPP, HHFE, or PPK with or without other body part involvement. Only those who had not received any topical or systemic treatment within the past month were included in the study after execution of informed written consent.

Exclusion criteria

The following patients were excluded from the study: those who had been on topical or systemic medication within the last month, moribund patients, and those with acute palmoplantar dermatoses such as fungal, bacterial infection, vesiculobullous, drug-induced, and other variants of hand eczema, such as irritant contact dermatitis, allergic contact dermatitis, pompholyx, fingertip dermatitis, etc. were excluded from the study.

Sample size:

To calculate the sample size for this study, the following formula was used for estimating a proportion of a population:

$$n = \frac{Z^2 \times p \times (1-p)}{E^2}$$

Where:

- n = sample size
- Z = Z-score corresponding to the desired level of confidence
- p = estimated proportion in the population
- E = margin of error

Bias

There was a chance that bias would arise when the study first started, but it was avoided by giving all participants identical information.

Data Collection and Procedure

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The patients attending the DVL OPD were clinically diagnosed with PPP, HHFE, and PPK. Written informed consent was taken from the patients before conducting the study. A detailed history was obtained, and a thorough general, systemic, and local examination was performed. Demographic and clinical features were recorded in detail. Digital photographs of the patients were captured using an iPhone 11. Investigations such as potassium hydroxide (KOH) examination and biopsy were performed when required.

The DLQI of each patient was recorded using a pre-structured Proforma. Patients who participated in the study were given a Dermatology Life Quality Index (DLQI) questionnaire to complete. This questionnaire is a simple, self-administered, and user-friendly validated questionnaire in English that is intended for use by adults over the age of 16. It comprises 10 questions that ask about the impact of skin disease on different aspects of the patient's health-related quality of life over the last week.[12] The questionnaire was also translated into Hindi and Bengali languages.

It consists of questions regarding:
Symptoms and feelings (Q1. Itchy, sore, painful, Q2. Social embarrassment)
Leisure (Q3. Interference with daily activities, Q4. Influence on clothes)
Daily activities (Q5. Social or leisure activities, Q6. Difficulty in sports)
Work and school (Q7. Prevention from studying or working)
Personal relationships (Q8. Problem with close friends,relatives, Q9. Sexualdifficulties)
Treatment (Q10. Problem because of treatment) The scoring of each question is done as follows:

- Very much- 3
- a lot -2
- a little -1
- not at all -0

The DLQI is calculated by adding the score of each question. The total DLQI score after adding is from 0 to 30, with higher scores indicating a greater impact on the individual's quality of life. The scores can be interpreted based on their effect on the patient's life:

Table 1: Interpretation of DLQI scores

Score	Effect on patient's life
0-1	No effect
2-5	Small effect
6-10	Moderate effect
11-20	Very large effect
21-30	Extremely large effect

Statistical analysis

The data obtained from the study was arranged in a tabulated manner in an Excel sheet, and the data was then subjected to statistical analysis. Statistical analysis was done using the SPSS software26.0 version.

Ethical considerations

The study protocol was approved by the Ethics Committee and written informed consent was received from all the participants.

OBSERVATIONS AND RESULTS

Fig. 1 shows the type of palmoplantar dermatoses and sex distribution. A total of 151 patients, 83 males (55%) and 68 females (45%) were enrolled in the study and divided into three types of hyperkeratotic palmoplantar dermatoses viz. PPP, HHFE, PPK. The PPP group consisted of a maximum of 74 patients (49%), followed by the HHFE group 45 patients (30%), and the PPK group 32 patients (21%). Among 74 patients in PPP, males outnumbered females with 46 males (30%) and 28 females (19%). In the HHFE group males and females were almost equal with 22 males (15%) and 23 females (15%). In the PPK group out of 32 patients, 15 were male (10%) and 17 were female (11%).

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Figure 1: Type of Dermatoses and sex distribution

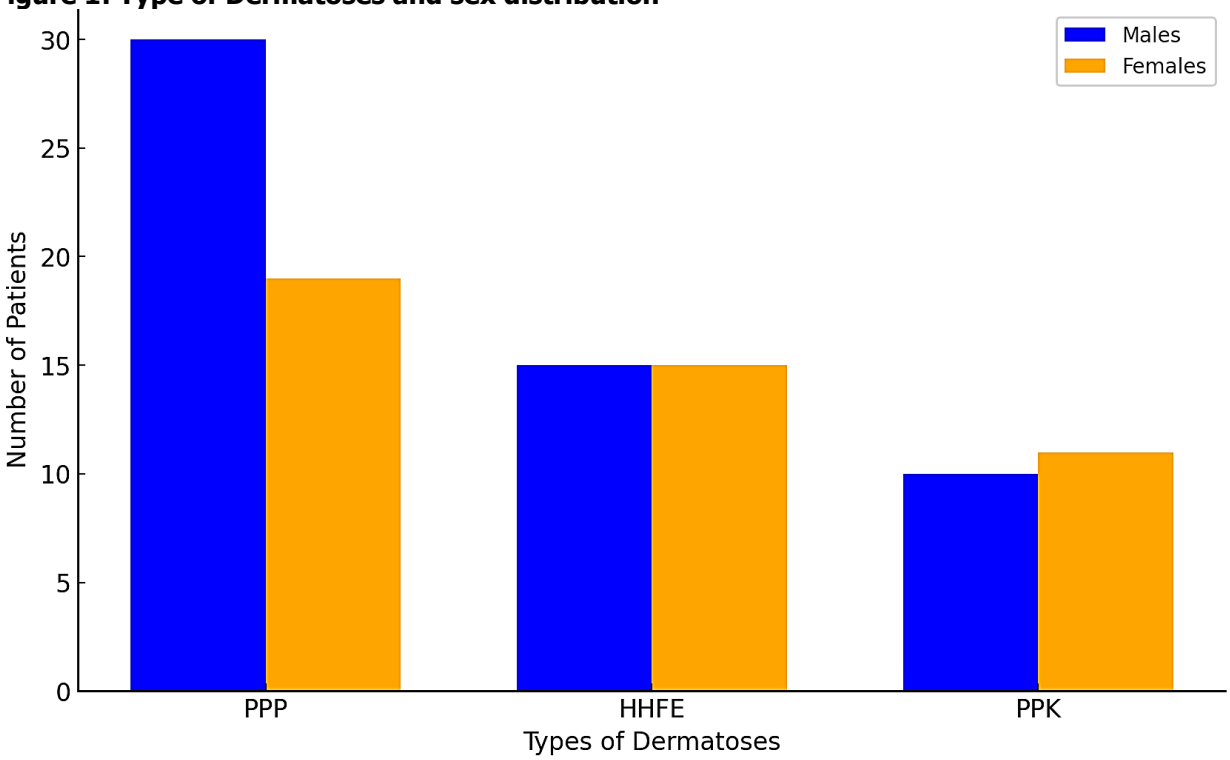

Table 2 shows the age distribution of patients in different groups of patients. A total of 151 patients were divided into 5 age groups 17-27, 28-38, 39-49, 50-60, and >61 years. In the PPP group maximum number of patients was in the age range of 39-49 years with 19 patients (25.68%). In the HHFE group, the maximum number of patients were in the age group of 50-60 years with 13 patients (28.89%) and in the PPK group, the maximum patients were in the age range of 17-27 years i.e. 11 patients (34.37%).

Table 2: Age distribution

Age group	PPP		HHFE		PPK	
	No. of patient	Percentage	No. of patient	Percentage	No. of patient	Percentage
17-27	6	8.11	12	26.67	11	34.37
28-38	18	24.32	12	26.67	5	15.63
39-49	19	25.68	6	13.33	5	15.63
50-60	17	22.98	13	28.89	8	25
>61	14	18.91	2	4.44	3	9.37

Figure 2 shows the duration of the disease. In all three diseases, a maximum number of patients were suffering from the disease between 1-5 years i.e., 52 patients (70.27%)in PPP, 34 patients (75.55%) in HHFE, and 18 patients (56.25%) in the PPK group respectively. The duration of disease was <1 year in 14 patients (18.92%) in PPP, 8 patients (17.78%) in HHFE, and 3 patients (9.37%) in the PPK group respectively. The duration of disease was >5 years in 8 patients (10.81%) in PPP, 3 patients (6.67%) in HHFE, and 11 patients (34.37%) in the PPK group respectively.

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Figure 2: Duration of disease

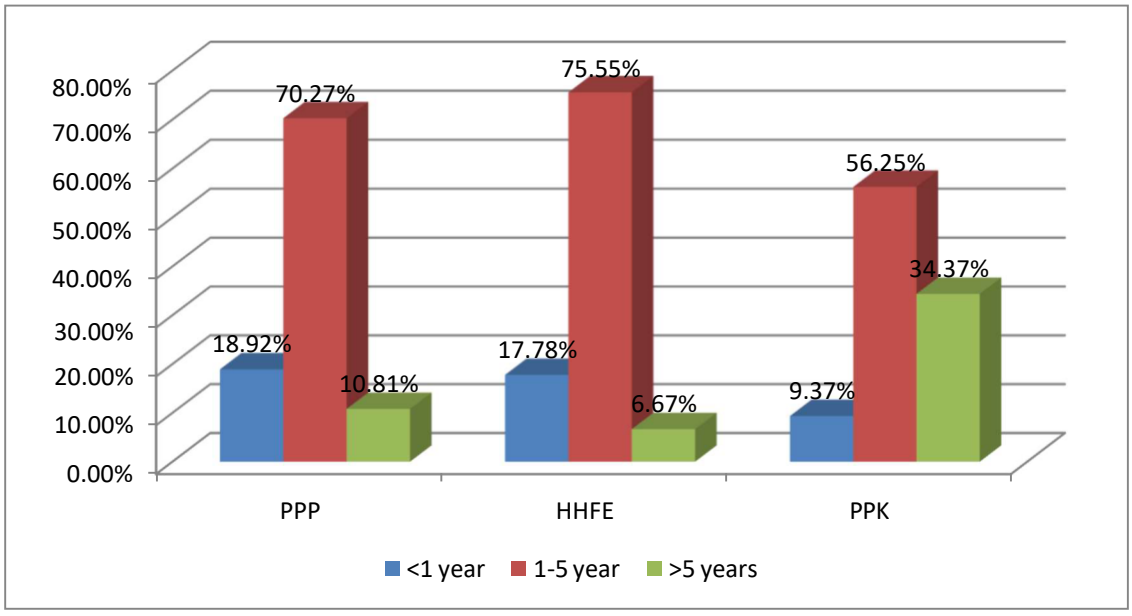

Table 3: Educational status

EDUCATION	NO. OF PATIENTS	PERCENTAGE
Illiterate	104	68.87
Primary	10	6.62
Secondary	20	13.25
Higher Secondary	5	3.31
Graduate and above	12	7.95

Table 4 shows the occupational status of patients. Among 151 patients 40(26.5%) patients were farmer, 53(35.1%) patients were housewives, 13(8.6%) patients were labor, 17(11.3%) were students and remaining 28(18.5%) patients were grouped together in others group. Maximum patients were housewives and farmers.

Table 4: Occupational status

Occupation	PPP	HHFE	PPK	Total	Percentage
Farmer	25	10	5	40	26.5
Housewife	24	17	12	53	35.1
Labor	4	7	2	13	8.6
Students	4	4	9	17	11.3
Others	17	7	4	28	18.5
Total	74	45	32	151	100

Table 5 shows the socioeconomic status of all the patients based on the Modified BG Prasad scale. The most common socioeconomic status was lower middle with 76 patients (50.33%) followed by lower class with 47 patients (31.13%). The minimum number of patients was in the upper class i.e., 1 patient (0.66%)

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Table 5: Socioeconomic status (Modified BG Prasad) [13]

Social class	Rs. / Month	No. of patients	Percentage
I Upper class	8763 and above	1	0.66%
II upper middle	4381.5- 8675.3	8	5.30%
III middle class	2630- 4294	19	12.58%
IV lower middle	1314.5- 2541.27	76	50.33%
V lower class	<1314.5	47	31.13%

Table 6 shows the mean DLQI scores in each group of patients. The maximum mean DLQI score was 13.31 in the HHFE group with 45 patients (30%), followed by the PPP group with 12.08 with 74 patients (49%) and 9.15 in the PPK group with 32 patients (21%). Both HHFEand PPP have moderate effects on DLQI while PPK has a small effect on DLQI.

Table 6: DLQI scores

Type of dermatoses	No. of patients	Percentage	DLQI
PPP	74	49	12.08
HHFE	45	30	13.31
PPK	32	21	9.15

Table 7 shows the scores of questions in PPP, HHFE, and PPK. The most common symptom affected was feeling followed by daily work- and job-related difficulty in all three dermatoses.

Table 7: Scores of DLQI questionnaire

Questionnaire	PPP				HHFE				PPK			
	0	1	2	3	0	1	2	3	0	1	2	3
1. Feelings	0	3	70	36	0	1	15	29	6	8	16	10
2. Embarrassment	14	29	16	15	11	10	11	13	11	7	5	9
3. Daily work	4	12	39	19	1	6	25	13	7	9	12	4
4. Clothes	46	17	5	6	24	9	10	2	18	7	7	0
5. Leisure	16	25	26	7	2	16	19	8	12	9	9	2
6. Sport	70	0	2	2	43	1	0	1	27	3	1	2
7. Job	3	12	22	37	1	6	14	24	4	11	5	12
8. Relationship	45	15	12	2	24	10	8	3	22	8	2	0
9. Sexual problem	67	6	2	0	41	3	1	0	30	2	0	0
10. Treatment	13	45	16	0	7	25	13	0	18	11	3	0

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Fig. 3: Palmoplantar psoriasis

Fig. 4: Hyperkeratotic hand-foot eczema

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Fig. 5: Palmoplantar keratoderma

DISCUSSION

The total number of patients involved in the present study was 151, out of which 83 were males (55%) and 68 were females (45%). PPP was the most common hyperkeratotic palmoplantar dermatosis with seventy-four patients (49%), followed by HHFE with forty-five patients (30%) and lastly, PPK with thirty-two patients (21%) In PPP group most affected age group was 39-49 years with 19 patients (25.68%), 50-60 years with 13 patients (28.89%) in HHFE group and 17- 27 years with 11 patients (34.37%) respectively. In the study, the most common occupational group was farmers with 40(26.49%) patients and housewife53(35.1%) patients among all three palmoplantar dermatoses.

In the study, the mean DLQI scores were 12.08 for PPP, 13.31 (maximum) in HHFE, and 9.15 in PPK groups respectively. It showed that both HHFE and PPP affect quality of life moderately while PPK has a small effect on DLQI.

Pragya Nair [14] found 53.46% males and 46.54% in her study. A study found that PPP was most common with thirty-two patients (40%), followed by HHFE with thirty patients (37.5%) and PPK with six patients (7.5%). [15] Mahagen et al. [16] found PPK to be common in males (64.63%). The most common affected age group was 11-20 years (32.92%), and laborers, farmers, and mechanical workers (48.16 %) were the most common occupational group.

In contrast to the study, Pragya Nair found [14] in her study that fifty-seven patients (28.21%) had palmoplantar psoriasis, 26 (12.87%) had hand eczema and 35 (17.32%) had palmoplantar keratoderma with mean DLQI scores of 8.60, 8.60, 8.53, respectively. Also, Charan et al [17], the mean DLQI score in hand eczema was 9.54. The difference in DLQI value between the current study and other studies may be due to the exclusion of patients who were under topical or systemic medications within the last month of our study.

GENERALIZABILITY

As the study is hospital-based, it does not represent the whole population, so, the findings cannot be generalized.

CONCLUSION

With this study, it can be concluded that chronic palmoplantar dermatoses like PPP, HHFE, and PPK have significant impairment in quality of life. The most common

occupational group involved are farmers and housewives. Thus, patient-oriented outcomes are important in measuring the burden of disease to plan appropriate management to improve the illness and quality of life. As was observed significant impairment in the quality of life of patients with HHFE, PPP, and PPK it is understood that these tools are very easy to use and recommend them for routine assessment before deciding the treatment plans and for better patient compliance.

LIMITATION

The relationship between the severity of chronic palmoplantar dermatoses and DLQI was not established. Only hyperkeratotic variants of hand eczema were included in the present study.

RECOMMENDATIONS

Early diagnosis and prompt treatment of hyperkeratotic palmoplantar dermatoses, such as PPP, HHFE, and PPK, are crucial for improving patients' quality of life. Routine use of the Dermatology Life Quality Index (DLQI) in clinical practice helps tailor personalized treatment plans, enhancing patient compliance and outcomes. Prioritizing early intervention and regular quality-of-life assessments optimizes the management of these chronic conditions.

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LIST OF ABBREVIATIONS

PPP - Palmoplantar Psoriasis
HHFE - Hyperkeratotic Hand and Foot Eczema
PPK - Palmoplantar Keratoderma
DLQI - Dermatology Life Quality Index
DVL - Dermatology, Venereology, and Leprosy
OPD - Outpatient Department
KOH - Potassium Hydroxide

SOURCE OF FUNDING

The study was not funded.

CONFLICT OF INTEREST

The authors have no competing interests to declare.

REFERENCES

1. Hongal AA, NadigaRajashekhar N, SomashekharGejje S. Palmoplantar dermatoses- A clinical study of 300 cases. J ClinDiagn Res 2016;10: WC04-7.
2. P V, Prasad K, Reddy D, et al. (December 08, 2021) Descriptive Study of the Clinical and Etiological Profiles of Palmoplantar Dermatoses in Patients Attending a Tertiary Care Hospital in Southern India. Cureus13(12): e20268.
3. Singhal R, Diwan NG, Nair PA. Impact of Palmoplantar Dermatoses on Quality of Life. Indian Dermatol Online J. 2018 Sep-Oct;9(5):309-313.
4. Vishal Wali and Eda Mrudula (2023); A clinical-epidemiological study on Palmoplantar Dermatoses. Int. J. Adv.Res.11(Jan),860-867.
5. Rao A, Khandpur S, Kalaivani M. A study of the histopathology of palmoplantar psoriasis and hyperkeratotic palmoplantar dermatitis. Indian J DermatolVenereol Leprol 2018; 84:27-33.
6. Miceli A, Schmieder GJ. Palmoplantar Psoriasis. 2023 Aug 8. In: StatPearls [Internet]? Treasure Island (FL): StatPearls Publishing; 2024 Jan-.
7. Coenraads PJ. Hand eczema. N Engl J Med. 2012; 367(19): 1829- 1837.
8. Politek K, Loman L, Pas HH, et al. Hyperkeratotic hand eczema: eczema or not? *Contact Dermatitis*. 2020;83(3):196-205.
9. Kezic S. Atopic dermatitis: risk estimates for hand eczema. Br J Dermatol.2018;178(4):827.
10. Lakshmi C, Srinivas C R. Hand eczema: An update. Indian J Dermatol Venereology Leprol 2012;78:569-582.
11. Mohanasundari, P S (2012) Clinical Study on PalmoplantarKeratoderma
12. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)- A simple practical measure for routine clinical use. ClinExpDermatol 1994 May;19(3):210-216.
13. Mahantshetti S, Singh J, Dhandapani S. Updated Modified BG Prasad Classification for October 2023. Natl J Community Med 2024;15(1):89-90.
14. Nair PA, Diwan NG, Singhal R, Vora RV. A Prospective Study of Clinical Profile in Patients of Palmoplantar Dermatoses. Indian Dermatol Online J. 2017 Sep-Oct;8(5):331-335.
15. P VS, Prasad KN, Reddy DS, Boppani PK. Descriptive Study of the Clinical and Etiological Profiles of Palmoplantar Dermatoses in Patients Attending Tertiary Care Hospitals in Southern India. Cureus. 2021 Dec 8;13(12).
16. Mahajan PM, Gharpuray MB, Kulkarni V. Clinical and histopathological study of palmoplantar

keratoderma. Indian J Dermatol Venereol Leprol. 1994; 60:258–61.
17. Charan UP, Peter CD, Pulimood SA. Impact of hand eczema severity on quality of life. Indian Dermatol Online J. 2013; 4:102-5.

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