Indian Journal of Health Care, Medical & Pharmacy Practice (Vol 7, Issue 1, Jan-June 2026)
Home page of the journal: https://ijhmp.com/Home

Research Article

A CLINICO-EPIDEMIOLOGICAL STUDY OF FACIAL PIGMENTARY DISORDERS

Neelima Goyal[1], Ashok. S. Hogade[2], Juhi Tomar[3]*

[1]Associate Professor, Department of Dermatology, PIMS, Umarda, Udaipur, Rajasthan, India.
[2]Professor and Head, Department of Dermatology, PIMS, Umarda, Udaipur, Rajasthan, India.
[3]Junior Resident -3rd Year, Department of Dermatology, PIMS, Umarda, Udaipur, Rajasthan, India.

Corresponding Author*: Dr. Juhi Tomar, Junior Resident -3rd Year, Department of Dermatology, PIMS, Umarda, Udaipur, Rajasthan, India.

Email ID: juhitomar@gmail.com

DOI: https://doi.org/10.59551/IJHMP/25832069/2026.7.1.115

How to cite this article: Goyal N, Hogade AS, Tomar J. A Clinico-Epidemiological Study Of Facial Pigmentary Disorders. *Indian J. Health Care, Med. Pharm. Pract.* 2026;7(1):126-131.

Received: 17 March, 2026, Decision for Acceptance: 20 April, 2026

ABSTRACT

Background: Facial pigmentary disorders are among the most common dermatological conditions and represent an important cosmetic concern for many patients. These disorders result from alterations in melanin production, distribution, or function within the skin and may present as hyperpigmentation or hypopigmentation. Although generally benign, facial pigmentary disorders can cause considerable psychological distress and negatively affect quality of life.

Objectives: To evaluate the clinical profile and epidemiological characteristics of facial pigmentary disorders among patients attending a dermatology outpatient department.

Methods: This cross-sectional study included 325 patients presenting with facial pigmentary disorders at a tertiary care hospital. Detailed demographic information, clinical history, and dermatological examination findings were recorded using a structured proforma. Data regarding age, gender, occupation, socioeconomic status, presenting complaints, clinical diagnosis, and associated epidemiological factors were analyzed using descriptive statistics.

Results: A total of 325 patients were included in the study, with a mean age of 28.94 ± 7.68 years. Females constituted the majority of participants (60%), while males accounted for 40%. Most patients belonged to the lower middle socioeconomic class (62.5%), and housewives represented the largest occupational group (50.2%). Hyperpigmented plaques were the most common clinical presentation (75.38%). Among facial pigmentary disorders, melasma was the most prevalent condition (46.46%), followed by post-inflammatory hyperpigmentation (15.38%) and periorbital melanosis (10.46%). Sun exposure, cosmetic use, and inflammatory dermatoses such as acne were identified as common associated factors.

Conclusion: Facial pigmentary disorders are common dermatological conditions with significant cosmetic implications. Melasma was the most frequently observed disorder in the present study. Identification of associated factors such as sun exposure and cosmetic use is essential for early diagnosis and effective management.

KEYWORDS: Facial Pigmentary Disorders, Melasma, Post-inflammatory Hyperpigmentation, Periorbital Melanosis, Hyperpigmentation, Dermatology.

Introduction

Pigmentary disorders are among the most common dermatological conditions encountered in both primary care and specialist dermatology practice. These disorders result from alterations in melanin production, distribution, or function within the skin, leading to visible changes in skin colour[1]. Although most pigmentary disorders are benign and can be diagnosed clinically based on their characteristic morphology and distribution, some pigmented lesions may clinically resemble malignant melanoma or its precursor lesions, necessitating histopathological evaluation to establish an accurate diagnosis[2].

Despite rarely posing a direct threat to physical health, pigmentary disorders often cause considerable cosmetic concern and psychological distress. Alterations in skin colour, particularly on visible areas such as the face, may negatively affect self-esteem, body image, and social interactions, thereby impairing quality of life[3]. Early recognition and appropriate management are therefore important components of dermatological care.

Pigmentary disorders are broadly classified into hyperpigmentary and hypopigmentary conditions. Hyperpigmentation occurs due to increased melanin synthesis or abnormal melanin distribution and includes conditions such as melasma, post-inflammatory hyperpigmentation, ephelides, periorbital hypermelanosis, tanning, Addisonian pigmentation, and Riehl's melanosis[4]. These disorders may arise from various factors including ultraviolet radiation exposure, hormonal influences, inflammatory dermatoses, genetic predisposition, and certain medications. Post-inflammatory hyperpigmentation is particularly common following inflammatory skin diseases and is more frequently observed in individuals with darker skin types[5].

Hypopigmentary disorders occur due to a reduction in melanocyte number or impairment in melanin synthesis or transfer. Conditions such as vitiligo, pityriasis alba, post-inflammatory hypopigmentation, and leprosy are common causes of pigment loss[6]. These disorders may present as localized or generalized areas of lighter skin and often have a chronic course.

Skin pigmentation varies among individuals and is commonly classified using the Fitzpatrick skin type scale (I–VI), which describes the skin's response to ultraviolet radiation[7]. Certain pigmentary disorders demonstrate variation in prevalence across different skin types. Understanding the clinical profile of pigmentary disorders is therefore important for accurate diagnosis and appropriate management. Hence, the present study was undertaken to evaluate the clinical pattern of pigmentary disorders among patients attending a dermatology outpatient department.

Materials and Methods

Study Design and Setting

This cross-sectional observational study was conducted in the Department of Dermatology at Pacific Institute of Medical Sciences and Research, Udaipur, Rajasthan, India. The institute is a tertiary care teaching hospital catering to patients from both urban and rural areas of southern Rajasthan. The study was carried out over a period of 20 months from June 2024 to April 2026 after obtaining approval from the Institutional Ethics Committee. Patients presenting with facial pigmentary disorders in the dermatology outpatient department were evaluated and those fulfilling the eligibility criteria were included in the study.

Study Population

Patients aged between 20 and 60 years of either gender presenting with facial pigmentary disorders were screened for inclusion in the study. A total of 325 patients who met the inclusion criteria and provided written informed consent were enrolled. Patients with hyperpigmentary disorders such as melasma, post-inflammatory hyperpigmentation, ephelides, periorbital melanosis, and tanning, as well as hypopigmentary disorders including vitiligo and pityriasis alba, were included. Patients who were unwilling to participate or did not provide consent, those with severe systemic illness interfering with clinical evaluation, or patients with incomplete clinical data were excluded from the study.

Data Collection Procedure

After obtaining written informed consent, detailed clinical information was recorded using a predesigned structured proforma. Sociodemographic data including age, gender, marital status, occupation, and socioeconomic status were documented. A detailed clinical history regarding onset, duration, progression of lesions, possible triggering factors such as sun exposure, cosmetic use, trauma, or associated dermatological conditions was obtained. A thorough general physical examination and detailed dermatological examination were performed in all patients. The morphology, distribution, number, and pattern of lesions were carefully recorded. In selected cases, laboratory investigations such as haemogram, random blood glucose levels, and thyroid function tests were performed to identify any associated systemic conditions.

Statistical Analysis

All collected data were entered into Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 31.0 (IBM Corp., Armonk, NY, USA). Quantitative variables were expressed as mean ± standard deviation (SD), whereas categorical variables were presented

ISSN 2583-2069

as frequencies and percentages. The chi-square test was used to assess associations between categorical variables, and the independent t-test was applied to compare continuous variables where appropriate. Pearson's correlation analysis was used to assess relationships between variables. A p-value <0.05 was considered statistically significant.

Ethical Considerations

The study was conducted in accordance with the ethical principles of biomedical research involving human participants. Ethical clearance was obtained from the Institutional Ethics Committee of Pacific Institute of Medical Sciences and Research, Udaipur. Written informed consent was obtained from all participants prior to their enrolment in the study.

Results

A total of 325 patients with facial pigmentary disorders were included in the study. The mean age of the participants was 28.94 ± 7.68 years, and the mean body weight was 57.76 ± 8.24 kg. Females constituted the majority of the study population (60%) compared to males (40%). Most participants were married (67.1%), while 32.9% were unmarried (Table 1).

Regarding occupational status, farmers represented the largest group (50.2%), followed by housewife (33.8%), student (12%), and businessmen (4%). With respect to socioeconomic status, the majority of participants belonged to the lower middle class (62.5%), followed by the upper middle class (34.2%), whereas only 3.1% belonged to the upper lower class and 0.3% to the upper class (Table 2).

The most common clinical presentation was hyperpigmented plaques, observed in 75.38% of patients, followed by hyperpigmentation around the lips (10.15%) and erythematous plaques (8.31%). Hypopigmented macules and plaques were less common, accounting for 2.77% and 3.38% of cases, respectively (Table 3).

Among the different facial pigmentary disorders, melasma was the most prevalent condition (46.46%), followed by post-inflammatory hyperpigmentation (15.38%) and periorbital melanosis (10.46%). Other conditions observed included ephelides (5.23%), Addisonian pigmentation (3.38%), tanning (3.38%), and acanthosis nigricans (1.23%). Among hypopigmentary disorders, vitiligo vulgaris accounted for 5.54% of cases, while pityriasis alba was observed in 0.62% of patients (Table 4).

Several epidemiological factors and systemic associations were identified in the study population. Sun exposure was a common contributing factor in ephelides, melasma, periorbital melanosis, and tanning, whereas cosmetic use was associated with periorbital melanosis and Riehl's melanosis. Post-inflammatory hyperpigmentation was frequently associated with acne and skin trauma. Diabetes mellitus was observed in a few patients with acanthosis nigricans, Addisonian pigmentation, post-inflammatory hyperpigmentation, and vitiligo vulgaris (Figure 1).

Table 1: Baseline demographic characteristics of the study participants (n = 325)

Variable	Value
Age (years), mean ± SD	28.94 ± 7.68
Weight (kg), mean ± SD	57.76 ± 8.24
Female, n (%)	195 (60.0)
Male, n (%)	130 (40.0)
Married, n (%)	218 (67.1)
Unmarried, n (%)	107 (32.9)

Table 2: Socioeconomic and occupational profile of participants (n = 325)

Variable	Number	Percentage (%)
Occupation		
Farmer	163	50.2
Housewife	110	33.8
student	39	12.0
Businessman	13	4.0
Socioeconomic status		
Lower middle	203	62.5
Upper lower	10	3.1
Upper middle	111	34.2
Upper	1	0.3

Table 3: Clinical presentation of facial pigmentary disorders (n = 325)

Presenting complaints	Number	Percentage (%)
Hyperpigmented plaques	245	75.38
Hyperpigmentation around lips	33	10.15
Hyperpigmented macules	13	4.0
Hypopigmented plaques	11	3.38
Hypopigmented macules	9	2.77
Erythematous plaques	27	8.31
Depigmented macules	2	0.62

Table 4: Distribution of different types of facial pigmentary disorders (n = 325)

Type of disorder	Number	Percentage (%)
Hyperpigmentary disorders		
Melasma	151	46.46
Post-inflammatory hyperpigmentation	50	15.38
Periorbital melanosis	34	10.46
Ephelides	17	5.23
Addisonian pigmentation	11	3.38
Tanning	11	3.38
Acanthosis nigricans	4	1.23
Riehl's melanosis	2	0.62
Seborrheic melanosis	1	0.31
Perioral melanosis	1	0.31
Hypopigmentary disorders		
Vitiligo vulgaris	18	5.54
Pityriasis alba	2	0.62

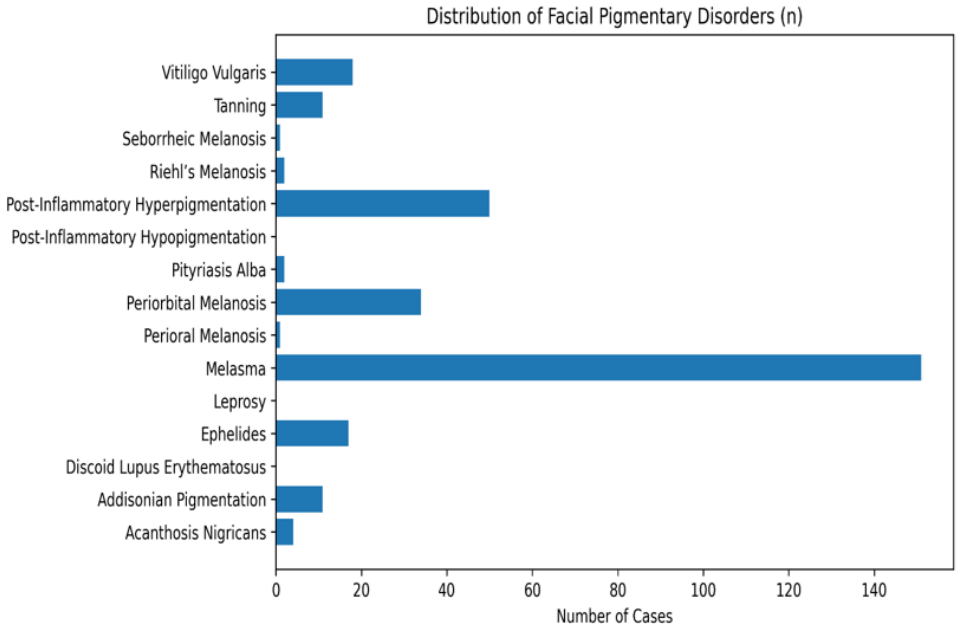

Figure 1: Associated epidemiological factors and systemic conditions

ISSN 2583-2069

Discussion

The present study evaluated the clinical and epidemiological profile of facial pigmentary disorders among patients attending a dermatology outpatient department. The mean age of participants (28.94 ± 7.68 years) indicates that these disorders predominantly affect young adults. A similar age distribution was reported by Tiwari et al. (2025), and consistent findings have also been documented by Kumar et al. (2025), who observed a higher prevalence of pigmentary disorders in the third and fourth decades of life. This trend may be attributed to increased cosmetic awareness and greater exposure to environmental risk factors such as sunlight and cosmetic products[8,9].

A female predominance (60%) was observed in the present study, which is in agreement with findings reported by Nouveau S et al. (2016) and Lawson et al. (2017), both of whom documented a higher prevalence of facial pigmentary disorders among women[10,11]. This gender disparity may be explained by hormonal influences, frequent use of cosmetics, and increased healthcare-seeking behavior, as also highlighted by Tanghetti EA et al. (2014)[12].

Regarding occupational status, housewives constituted the largest proportion of patients, followed by students. Similar observations were made by Selvaraj and Punniyaseelan (2025), suggesting that this pattern may reflect both the demographic composition of the study population and the higher likelihood of women seeking medical consultation for cosmetic concerns[13]. Furthermore, the predominance of individuals from the lower middle socioeconomic class may influence both exposure patterns and access to healthcare services.

Hyperpigmented plaques were the most common presenting complaint in this study. This finding aligns with the observations of Moolla and Miller (2023), who emphasized that facial hyperpigmentation is a frequent dermatological concern due to continuous exposure of the face to environmental factors such as ultraviolet radiation, pollution, and cosmetic products[14].

Among the various pigmentary disorders, melasma was the most prevalent condition (46.46%). Similar findings have been reported by Mpofana N et al. (2023) and Ghasemiyeh et al. (2024), who identified melasma as one of the most common causes of facial hyperpigmentation, particularly in individuals with darker skin types[15,16]. The multifactorial pathogenesis of melasma, involving genetic predisposition, hormonal influences, and ultraviolet radiation exposure, has been well described by Espósito et al. (2022)[17].

Post-inflammatory hyperpigmentation (PIH) was the second most common condition observed in the present study (15.38%). This condition typically follows inflammatory dermatoses such as acne or skin injury. Taylor et al. (2009) explained that increased melanocyte stimulation and melanin deposition following inflammation are key mechanisms underlying PIH[18].

Periorbital melanosis was observed in a subset of patients. Sarkar et al. (2026) reported that its development is multifactorial, involving genetic predisposition, chronic sun exposure, cosmetic use, and prolonged screen exposure, all of which may contribute to pigmentary and vascular changes in the periorbital region[19].

In the present study, sun exposure was identified as a significant contributing factor in several pigmentary disorders, including melasma, ephelides, and tanning. Cosmetic use was associated with periorbital melanosis and Riehl's melanosis, while post-inflammatory hyperpigmentation was frequently linked to acne and trauma. Similar associations have been reported by Aljabr A et al. (2026)[20]. These findings further support the multifactorial etiology of pigmentary disorders, as emphasized by Ariayagam and Rayon (2016), highlighting the importance of identifying modifiable risk factors in clinical practice[21].

Conclusion

Facial pigmentary disorders are common dermatological conditions with significant cosmetic and psychological impact. Melasma was the most frequently observed disorder in the present study, followed by post-inflammatory hyperpigmentation and periorbital melanosis. Sun exposure, cosmetic use, and inflammatory skin conditions were important associated factors. Early recognition and appropriate management of these conditions are important to improve patient outcomes and quality of life.

Generative AI statement

No use of artificial intelligence was involved in the study.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Thawabteh AM, Jibreen A, Karaman D, Thawabteh A, Karaman R. Skin pigmentation types, causes and treatment—a review. Molecules. 2023 Jun 18;28(12):4839.
2. Mevorach L, Farcomeni A, Pellacani G, Cantisani C. A comparison of skin lesions' diagnoses between AI-based image classification, an expert dermatologist, and a non-expert. Diagnostics. 2025 Apr 28;15(9):1115.
3. Kiser A, Korkomaz T, Ong B, Kumar AB, França K. Geriatric Psychodermatology: Current Concepts and Therapeutic Strategies. Dermatology and Therapy. 2026 Jan 16:1-9.
4. Nicolaidou E, Katsambas AD. Pigmentation disorders: hyperpigmentation and hypopigmentation. Clinics in dermatology. 2014 Jan 1;32(1):66-72.
5. Markiewicz E, Karaman-Jurukovska N, Mammone

T, Idowu OC. Post-inflammatory hyperpigmentation in dark skin: molecular mechanism and skincare implications. Clinical, Cosmetic and Investigational Dermatology. 2022 Jan 1:2555-65.
6. Rao M, Young K, Jackson-Cowan L, Kourosh A, Theodosakis N. Post-inflammatory hypopigmentation: review of the etiology, clinical manifestations, and treatment options. Journal of Clinical Medicine. 2023 Feb 3;12(3):1243.
7. Sharma AN, Patel BC. Laser Fitzpatrick skin type recommendations.
8. Tiwari M, Tripathi M, Tiwari A, Thagele P, Choudhary N, Rana N. Clinico-Epidemiological Study of Facial Dermatoses. Cureus. 2025 Dec 23;17(12).
9. Kumar D, Sood R, Tiwari P. Melasma management: Unveiling recent breakthroughs through literature analysis. Health Sciences Review. 2025 Mar 1;14:100213.
10. Nouveau S, Agrawal D, Kohli M, Bernerd F, Misra N, Nayak CS. Skin hyperpigmentation in Indian population: Insights and best practice. Indian journal of dermatology. 2016 Sep 1;61(5):487-95.
11. Lawson CN, Hollinger J, Sethi S, Rodney I, Sarkar R, Dlova N, Callender VD. Updates in the understanding and treatments of skin & hair disorders in women of color. International journal of women's dermatology. 2017 Mar 1;3(1):S21-37.
12. Tanghetti EA, Kawata AK, Daniels SR, Yeomans K, Burk CT, Callender VD. Understanding the burden of adult female acne. The Journal of clinical and aesthetic dermatology. 2014 Feb;7(2):22.
13. Selvaraj N, Punniyaseelan A. Cross-Sectional Study on Impact and Effect of Cosmetics upon Female Medical Students. Indian Journal of Dermatology. 2025 May 1;70(3):169.
14. Moolla S, Miller-Monthrope Y. Dermatology: how to manage facial hyperpigmentation in skin of colour. Drugs in context. 2022 May 31;11:2021-11.
15. Mpofana N, Chibi B, Gqaleni N, Hussein A, Finlayson AJ, Kgarosi K, Dlova NC. Melasma in people with darker skin types: a scoping review protocol on prevalence, treatment options for melasma and impact on quality of life. Systematic Reviews. 2023 Aug 10;12(1):139.
16. Ghasemiyeh P, Fazlinejad R, Kiafar MR, Rasekh S, Mokhtarzadegan M, Mohammadi-Samani S. Different therapeutic approaches in melasma: advances and limitations. Frontiers in Pharmacology. 2024 Apr 2;15:1337282.
17. Espósito AC, Cassiano DP, da Silva CN, Lima PB, Dias JA, Hassun K, Bagatin E, Miot LD, Miot HA. Update on melasma—Part I: pathogenesis. Dermatology and Therapy. 2022 Sep;12(9):1967-88.
18. Taylor S, Grimes P, Lim J, Im S, Lui H. Postinflammatory hyperpigmentation. Journal of cutaneous medicine and surgery. 2009 Jul;13(4):183-91.
19. Sarkar R, Ranjan R, Garg S, Garg VK, Sonthalia S, Bansal S. Periorbital hyperpigmentation: a comprehensive review. The Journal of clinical and aesthetic dermatology. 2016 Jan 1;9(1):49.
20. AlJabr A, AlAnazi AM, AlEtebi RA. Tranexamic Acid for Hyperpigmentation Disorders: A Literature Review on Efficacy and Safety in Melasma and PIH. Journal of Cosmetic Dermatology. 2026 Feb;25(2):e70692.
21. Arianayagam S, Ryan TJ. Disorders of pigmentation of the skin–hypotheses underlying interventions by multiple systems of medicine: is there a role for integrated medicine?. Current Science. 2016 Jul 25:325-36.

ISSN 2583-2069