

# Clinico-Epidemiological Study to Assess Associated Factors and Quality of Life in Female Patients with Facial Melanosis Attending a Tertiary Care Centre in Kelambakkam

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**Received:** 2nd Mar, 2026 | **Revised:** 14th Mar, 2026 | **Accepted:** 4th Apr, 2026 | **Available Online:** 20th Apr, 2026

## ABSTRACT

**Background:** Facial melanosis is a common cosmetic condition seen among women living in India. Since it is usually persistent and difficult to treat, it often causes distress and can affect the patient's self-confidence. Therefore, this study is done to identify the factors associated with facial melanosis and to assess its effect on quality of life using standard specific questionnaires.

**Materials and Methods:** A cross-sectional study was done among 86 female patients attending the dermatology OPD. Informed consent was obtained from the patients. A detailed history was obtained from patients regarding their sun exposure, use of cosmetics, oral contraceptive pills, use of topical steroids, associated comorbidities, and family history. Patients were examined, which included classification of facial melanosis and assessment of Fitzpatrick skin type. Quality of life was assessed using Dermatology Life Quality Index.

**Results:** Our study shows that Fitzpatrick skin type IV was the most common among participants (44.2%). Prolonged sun exposure of more than five hours per day was reported by 36% of patients, whereas 70.9% did not use sunscreen. Oral contraceptive pill use was used by 41.9% of patients, and 36% had a family history of facial melanosis. The patient's quality of life was assessed using DLQI, which shows that 26% of patients experienced a huge effect on their quality of life.

**Conclusion:** Facial melanosis is the most common disease among women that has a significant impact on the quality of life in women. Early identification of risk factors and health education are important for its management.

**Keywords:** facial melanosis, melasma, post-inflammatory hyperpigmentation, lichen planus pigmentosus, DLQI.

**How to cite this article:** Shri Nidhi G, Kunjaram G. Clinico-Epidemiological Study to Assess Associated Factors and Quality of Life in Female Patients with Facial Melanosis Attending a Tertiary Care Centre in Kelambakkam. *Int J Drug Deliv Technol.* 2026;16(33s):728-733. DOI: 10.25258/ijddt.16.33s.86

**Source of support:** Nil.

**Conflict of interest:** The authors declare no conflict of interest.

## INTRODUCTION:

Facial melanosis refers to a spectrum of acquired or idiopathic pigmentary conditions characterised by enhanced pigmentation involving the facial skin, causing visible cosmetic disfigurement and significant psychosocial consequences. It includes disorders like melasma, PIH, lichen planus pigmentosus, periocular

melanosis, and periorbital melanosis. The importance of these disorders is growing, as they form a major percentage of dermatology consultations. These conditions are frequently seen in South Asian women because of their naturally higher melanin levels and increased exposure to sunlight. Facial melanosis is, however, more common in Fitzpatrick IV-VI and

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responds poorly to treatment<sup>(1)</sup>. Among them, melasma is the most common form of melanosis, especially affecting women in their reproductive age<sup>(2)</sup>. Despite its high prevalence, limited clinico-epidemiological data exist in India on associated risk factors and the psychosocial burden of facial melanosis. Due to its cosmetic concern, many experience embarrassment, poor self-esteem and social withdrawal<sup>(3)</sup>.

As facial melanosis is a common cosmetic problem, many patients experience embarrassment, reduced self-esteem, low self-confidence, and social withdrawal, thereby reducing their overall quality of life. Given these problems, a detailed study on facial melanosis and its risk factors is essential. Identification of these factors will help in providing appropriate counselling and choosing suitable treatment strategies. Hence, this study is done to identify and evaluate the risk factors associated with facial melanosis and to assess their quality of life using the Dermatology Life Quality Index.

### AIMS AND OBJECTIVES:

- To identify and evaluate the associated factors of facial melanosis among female patients attending the Dermatology OPD.
- To assess the impact of facial melanosis on quality of life using a standardised dermatology-specific QoL instrument

### MATERIALS AND METHODS:

**STUDY TYPE:** Cross-sectional study

**STUDY AREA:** Tertiary care teaching medical college and hospital in the Chengalpattu district

**STUDY POPULATION:** Patient attend the dermatology outpatient department

#### SAMPLE SIZE:

The sample size was determined to estimate the mean Dermatology Life Quality Index (DLQI) score among women presenting with facial melanosis. The standard deviation ( $\sigma$ ) of the DLQI was derived from a previous study by Amatya et al., which reported a maximum standard deviation of 2.24 across different types of facial melanoses in an outpatient dermatology setting. The following formula for estimating a single mean was applied:

$$n = (Z_{1-\alpha/2} \times \sigma)^2 / d^2$$

Where: -  $Z_{1-\alpha/2} = 1.96$  (for 95% confidence level) -  $\sigma = 2.24$  (standard deviation from reference study) -  $d = 0.5$  (desired absolute precision in DLQI points)

Substituting the values:

$$n = (1.96^2 \times 2.24^2) / (0.5)^2$$

$$n = (3.8416 \times 5.0176) / 0.25$$

$$n = 77.08 \approx 78$$

Allowing for a 10% non-response rate, the final sample size required was 86 participants.

### INCLUSION CRITERIA:

Patients presenting to the outpatient department of Dermatology & Venereology and Leprosy with pigmentation over the face who fulfil the following criteria.

- Female patients more than 18 years of age.
- Clinically diagnosed with facial melanosis (melasma, LPP, PIH)
- Willing to give informed consent.

### EXCLUSION CRITERIA:

- Patients with systemic disorders are known to cause pigmentation changes (such as Addison's disease, hemochromatosis, and porphyrias)
- Patients receiving systemic medications known to cause diffuse hyperpigmentation (minocycline, clofazimine, amiodarone, antimalarials)
- Patients who are currently undergoing treatment for facial melanosis or have been treated within the last 3 months.

A cross-sectional study was conducted among 86 women above 18 years of age who presented with facial hyperpigmentation to the dermatology outpatient department of a tertiary care hospital in Kelambakkam between September 2025 and November 2025. The study commenced only after receiving approval from the Institution Human Ethics Committee.

According to the authors, all methods used in this work abide by the applicable institutional ethical standards (Ethics Committee of the Chettinad Hospital & Research Institute).

All participants provided written informed consent in their native language after receiving a clear explanation of the study procedure. A detailed history was taken, with documentation of predefined contributing factors such as sun exposure, cosmetic use, intake of oral contraceptive pills, application of topical steroids, and the presence of systemic

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conditions, including thyroid disorders, diabetes, and polycystic ovarian syndrome. Drug history was noted, also the use of photosensitivity drugs such as antimalarials, tetracyclines, amiodarone, clofazimine, and minocycline, along with family history were noted. After thorough history taking, clinical examination was done, and the Fitzpatrick skin type, site and distribution of the facial melanosis, type of lesion, border and pattern were noted. The impact of facial melanosis on the patient's quality of life will be assessed using a validated Dermatology Life Quality Index (DLQI). The Dermatology Life Quality Index (DLQI) score helps assess how much a skin condition affects a person's daily life. A score of 0–1 indicates no effect on quality of life, while 2–5 suggests a small effect. Scores between 6–10 reflect a moderate effect, and those in the range of 11–20 show a very large effect on daily activities and emotional well-being. The highest scores, 21–30, represent an extremely large effect, indicating that the skin condition significantly interferes with a person's overall quality of life.

### RESULTS

**Table 1. Distribution of study participants based on Sociodemographic characteristics (N=86)**

Variables	Frequency (n)	Percentage (%)
<b>Socioeconomic status</b>		
I	4	4.7
II	18	20.9
III	47	54.7
IV	19.8	19.8
<b>Residence</b>		
Rural	37	43
Urban	49	57

The study participants were categorised into different socio-economic classes using Modified B.G. Prasad scale. Most of the patients in this study belonged to the middle socioeconomic strata. More than half of them (54.7%) were in Class III. Class II included 20.9% of the patients, while only 4.7% were from Class I. About 19.8% of the patients belonged to Class IV. Overall, the majority of the study population was from the middle socioeconomic group. Regarding places of residence, 57% of the patients were from urban areas, whereas 43% were from rural areas. This shows that slightly more patients in the study were from urban regions. (Table 1)

**Table 2. Distribution of study participants based on the Fitzpatrick skin type and skin-related illness (N=86)**

Variables	Frequency (n)	Percentage (%)
<b>Fitzpatrick skin type</b>		
Type I	0	0
Type II	1	1.7
Type III	30	34.8
Type IV	38	44.2
Type V	17	19.8
Type VI	0	0
<b>Type of facial melanosis</b>		
LPP	8	9
Melasma	49	57
Perioral melanosis	6	7
Periorbital melanosis	7	8
PIH	13	15
Riehl's melanosis	3	4

Among the 86 patients studied, most had Fitzpatrick skin type III and IV. Skin type III was seen in 34.8% of the patients. Skin type IV was seen in 44.2% of the patients. Smaller numbers of the patients have skin type V (19.8%) and skin type II (1.7%). There were no patients with Fitzpatrick skin types 1 and VI in this study. Regarding facial melanosis, melasma was the most common finding. It was seen in 57% of patients. Post-inflammatory hyperpigmentation was present in 15% of the study population. Lichen planus pigmentosus (LPP) was noted in 9% of patients. Perioral melanosis was seen in 7% and periorbital melanosis in 8% of patients. Riehl's melanosis was observed in 4% of cases. (Table 2).

**Table 3. Distribution of study participants based on Sun exposure and photoprotection (N=86)**

Variables	Frequency (n)	Percentage (%)
<b>Daily sun exposure in hours</b>		
Less than 5 Hours	55	64
More than 5 Hours	31	36
<b>Use of sunscreen</b>		
No	61	70.9
Yes	25	29.1
<b>Cosmetic usage</b>		
No	48	55.8
Yes	38	44.2

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In this study, 64% of patients had daily sun exposure of less than five hours. The remaining 36% had sun exposure of more than five hours per day. Most patients did not use sunscreen. About 70.9% were not using sunscreen. Only 29.1% reported regular sunscreen use. Regarding cosmetic use, 55.8% of patients did not use cosmetic products. Cosmetic use was reported by 44.2% of patients. (Table 3).

**Table 4. Distribution of study participants based on topical and systemic use of drugs (N=86)**

Variables	Frequency (n)	Percentage (%)
<b>Topical steroid use</b>		
No	48	55.8
Yes	38	44.2
<b>Oral contraceptive pill intake</b>		
No	50	58.1
Yes	36	41.9
<b>Photosensitising drug intake</b>		
No	64	74.4
Yes	22	25.6

In the study population, 44.2% of patients reported using topical steroids. The remaining 55.8% had not used topical steroids. Oral contraceptive pill use was reported by 41.9% of the patients. The remaining 58.1% had no history of OCP intake. Photosensitising drugs were used by 25.6% of patients. Most patients, 74.4% reported no intake of photosensitising medications. (Table 4)

**Table 5. Distribution of study participants based on medical and family history (N=86)**

Family history	Frequency (n)	Percentage (%)
No	55	64
Yes	31	36
<b>Thyroid disorder</b>		
No	73	84.9
Yes	13	15.1
<b>Polycystic ovarian syndrome</b>		
No	61	70.9
Yes	25	29.1
<b>Diabetes Mellitus</b>		
No	79	91.9
Yes	7	8.1

In this population, a positive family history of similar conditions was reported by 36% of the participants, whereas the remaining 64% had no such family history. Regarding thyroid disorders, 15.1% of the

participants had a known thyroid-related condition, whereas the majority, 84.9%, did not report any thyroid disorder. In this study, 29.1% of the participants reported a history of polycystic ovarian syndrome (PCOS), while the remaining 70.9% did not. Diabetes mellitus was less common among the population, with only 8.1% reporting the condition and 91.9% having no history of diabetes. (Table 5)

**Table 6. Distribution of study participants based on the Dermatology Life Quality Index Questionnaire (N=86)**

Questionnaire	Not at all	A little	A lot	Very much
Embarrassed or self-conscious	4 (4.7)	9 (10.5)	35 (40.7)	38 (44.2)
Interference in going out	14 (16.3)	35 (40.7)	14 (16.3)	23 (26.7)
Influence on dressing	6 (7.0)	12 (14.0)	39 (45.3)	29 (33.7)
Effect on social activities	4 (4.7)	14 (16.3)	31 (36.0)	37 (43.0)
Difficulty in doing sports	58 (67.4)	9 (10.5)	10 (11.6)	9 (10.5)
Problem with work or study	12 (14.0)	18 (20.9)	30 (34.9)	26 (30.2)
Problem with close relationship	33 (33)	27 (31.4)	22 (25.6)	4 (4.7)
Sexual difficulties	59 (68.6)	15 (17.4)	12 (14.0)	0 (0)
Problems due to treatment	5 (5.8)	28 (32.6)	30 (34.9)	23 (26.7)

A substantial proportion of participants expressed feelings of embarrassment or self-consciousness, with 40.7% reporting this a lot and 44.2% reporting “very much”, indicating a pronounced emotional impact. In terms of limitations on going out, “a little” was the most commonly selected option (40.7%), with “very much” reported by 26.7%.

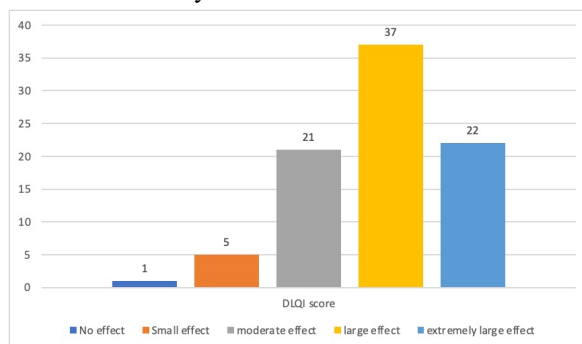
Regarding the effect on dressing, 45.3% of the participants reported that it affected them “a lot”. Another 33.7% reported being affected “very much”. A similar pattern was noted for social activities. About 36% reported “a lot” of effect, while 43% reported “very much”, showing a clear impact on social life. For difficulty in doing sports. Most participants (67.4%) reported “not at all”, indicating minimal effect. Only a small number selected higher categories. With respect to work or study, the common responses were “a lot” (34.9%) and “very much”

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(30.2%). Problems with close relationships were less severe. About 33% reported no problems, and 31.4% reported “a little”. Sexual difficulties were mostly absent. Nearly 68.6% selected “not at all”, and none selected “very much”. Treatment-related problems were frequently reported. About 39.9% reported “a lot” of difficulty, and 26.7% reported “very much”, indicating significant treatment-related concerns. (Table 6).

### Figure 1. Distribution based on DLQI score

The DLQI score distribution showed that most participants had a significant impact on quality of life due to their skin condition. Only one participant reported no effect, and five participants reported a small effect. A moderate effect was reported by 21 participants. Most patients were in the higher severity categories. A large effect was reported 37 participants, while an extremely large effect was reported by 22 participants. This shows that a considerable proportion of the study population had marked limitations in daily life.



### DISCUSSION:

Facial melanosis encompasses a varied group of acquired pigmentary disorders that often have a noticeable effect on the psychological health and social life of affected individuals<sup>(4)</sup>. This study presents an in-depth analysis of the clinical features, contributing factors, and quality-of-life impact among women with facial melanosis seen at a tertiary care centre. The observations from this study show that melasma was the most common condition, lifestyle factors such as sunscreen and cosmetic use played an important role, and these pigmentary disorders were associated with a marked reduction in quality of life. In the present study, most of the participants had Fitzpatrick skin types III and IV. The type IV was the most frequently observed (38 participants, 44.2%), followed by type III (30 participants, 34.8%), whereas skin types II and V were seen only in a few cases. This pattern mirrors the usual phototype distribution in the Indian population, where darker skin types

predominate and show a greater tendency to develop melanosis due to higher melanin levels and increased melanocyte activity. Comparable results have been reported by Dabbas et al. (2020)<sup>(4)</sup>.

Studies from India and Southeast Asia have shown a higher incidence of melasma and lichen planus pigmentosus among patients with Fitzpatrick skin types III and IV, that has been attributed to increase melanogenic potential with greater sensitivity to ultraviolet and visible light<sup>(5)</sup>.

In our study, melasma was the most commonly observed form of facial melanosis, affecting 49 participants (57%). Post-inflammatory hyperpigmentation was the next most common, seen in 13 participants (15.1%). Other diagnoses included lichen planus pigmentosus in 8 participants (9.3%), periorbital melanosis in 7 (8.1%), perioral melanosis in 6 (7%), and Riehl’s melanosis in 3 participants (3.5%). A similar distribution has been reported by Sarkar et al.(2019), which identified melasma and post-inflammatory hyperpigmentation as the common causes of facial pigmentation<sup>(6)</sup>. In this study, more participants came from cities than from village areas; 49 participants (57%) were urban, while 37 (43%) were rural. Other studies, like Grether-Beck et al (2017), have found similar results. Residing in urban area may expose people to more environmental factors, both indoors and outdoors, which can make the skin darker<sup>(7)</sup>.

Photoprotection emerged as a key factor in this study. A majority of participants, 61 out of 86, over 71% did not use sunscreen, whereas only 25 (29%) said that they were using it regularly, which is similar to the finding by AL Robaee (2010)<sup>(8)</sup>. Sunscreen is known to play a significant role in preventing the onset and progression of facial melanosis. Exposure to UV rays and visible light can increase pigmentation in the skin which is consistent with the findings of Moolla and Miller-Monthrope (2022)<sup>(9)</sup>. Many individuals use cosmetic products to conceal pigmentation, however, these can sometimes trigger pigmented contact dermatitis or Riehl’s melanosis<sup>(10)</sup>. Regarding family history, 31 participants (36%) reported similar pigmentation in relatives, while 55 (64%) did not, suggesting a possible genetic contribution, in line with study done by Fiastrol, Ifin et al<sup>(11)</sup>.

Similarly, OCP intake was reported in 36 participants (41.9%), underlining the significant hormonal contribution to pigmentary disorders through oestrogen-sensitive pathways, similar to the findings in Resnik et al<sup>(12)</sup>.

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Systemic morbidity was found in 7 participants (8.1%). While diabetes is not a classic driver of facial melanoses, metabolic dysfunction and chronic low-grade inflammation have been associated with altered melanogenesis and certain pigmentary patterns<sup>(13)</sup>.

Crucially, the Dermatology Life Quality Index (DLQI) scores demonstrated a significant psychosocial burden among individuals with facial melanosis. DLQI scores showed that a huge effect on quality of life was observed in 37 participants (43%), followed by an extremely large effect in 22 participants (25.6%) and a moderate effect in 21 participants (24.4%). A small effect was noted in 5 participants (5.8%), while only 1 participant (1.2%) reported no effect on quality of life. Similar inferences have been drawn from previous literature, where facial pigmentation, though not medically severe, has been shown to markedly influence emotional health, social behaviour, and daily functioning by affecting how individuals view themselves.<sup>(14)(15)</sup>

### CONCLUSION:

In female patients, facial pigmentation is usually multifactorial. These include genetic predisposition, environmental exposure, hormonal changes, and lifestyle habits. In this study, the pattern of pigmentation was found to be related to Fitzpatrick skin type, chronic sun exposure, cosmetic use, and underlying endocrinological factors. This shows that both internal and external factors are involved. Early identification of contributing factors is important in the management. Regular advice regarding photoprotection is of utmost importance. Proper counselling on cosmetic use is also required. The findings of this study indicate the need for individualised treatment and better community awareness for the prevention and treatment of facial melanosis.

### CONFLICT OF INTEREST:

None

### SOURCE OF FUNDING:

None

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