

## Fathom of Fondness in Females for Fairness: Analysis of Factors Leading to Topical Corticosteroid Abuse on Face

Suresh Mahadevarahalli Range Gowda<sup>1</sup>, Deepak Madhavrao<sup>1</sup>, Bharathi Gunjahalli<sup>2</sup>, Prajna Shetty<sup>1</sup> And Banavase Channakesvaiah Ravikumar<sup>1\*</sup>

<sup>1</sup>Department of DVL, Hassan institute of medical sciences, Hassan, Karnataka, India

<sup>2</sup>Department of Psychiatry, Hassan institute of medical sciences, Hassan, Karnataka, India

\*Corresponding author: Ravikumar BC, MBBS, MD, Professor of Department of DVL and Director, Hassan Institute of Medical Sciences, Hassan - 573201, Karnataka, India, Tel: +91-9448742905; E-mail: [dr.ravikumarbc@gmail.com](mailto:dr.ravikumarbc@gmail.com)

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### Abstract

**Background:** Topical corticosteroids (TCs) which were once considered a panacea of dermatological conditions, have now become a double-edged sword due to irrational use for their magical effects like increased fairness of skin after applying TCs. Prolonged and irrational use of TCs on face is globally prevalent and has reached a monstrous proportion in India.

**Objectives:** Aim of this study was to analyze various factors leading to TC abuse on the face (like socio-demographic) and assess the influence of personality traits among them who attended the dermatology OPD.

**Methods:** A cross-sectional questionnaire-based study was done on total of 1000 patients, out of which 500 patients with history of topical corticosteroid abuse on face were in the study group and 500 patients visiting dermatology OPD for facial dermatoses not using TC on face were in the control group and they were analyzed for various factors including personality traits.

**Results:** Out of 500 patients from study group, majority were females 411 (82.2%) and the most common age group was 21-25 years in 137(27.4%) patients. Majority were educated till secondary school 143(28.6%). Most common reason for TC usage and abuse was melasma i.e., 180(36%) patients and most common source was recommendation by friends 252(50.4%). Commonest TC abused was clobetasol propionate in 218(43.6%) patients. Most common localized side effect seen were acneiform eruptions and acne aggravation in 171(34.2%) patients. There was no statistically significant difference in personality traits between the study and control groups.

**Conclusion:** Topical corticosteroids abuse was more common in youngsters, especially females. Majority of TC abusers were from rural background, lower socio-economic-status, lesser educated and were influenced by their friends. Personality factors were not identified as a contributory factor. So, creating awareness among the rural population regarding the hazards of TCs would help prevent its abuse.

**Keywords:** *Topical corticosteroid; Abuse; Face; Personality traits*

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## **1. Introduction**

The introduction of topical corticosteroids (TCs) by Sulzberger and Witten in 1952 is considered to be the most significant landmark in the history of therapy of dermatological disorders [1]. They have anti-inflammatory, anti-proliferative, vasoconstrictive and immunosuppressive effects [2], hence they are used in the treatment of various autoimmune and inflammatory dermatological conditions [3].

By virtue of their anti-inflammatory and melanopenic effects they produce dramatic alleviation of itching and lighten pigmented skin blemishes [2]. These magical effects influence the user to continue TC usage and abuse thereby succumbing to its serious local side-effects.

TC abuse is defined as: person using or used one or more corticosteroid-based cream without prescription for more than 3 months continuously over the past six months [4].

## **2. Aims and Objective**

- To analyze various factors leading to topical corticosteroid abuse on face which included socio-demographic profile, which were the probable reason for misuse.
- To assess the influence of personality traits in patients abusing topical corticosteroid.

## **3. Materials and Methods**

A descriptive cross-sectional questionnaire based study was conducted on 1000 patients who presented to the dermatology OPD with various skin ailments like acne, melasma, post inflammatory pigmentation and tinea faciei, of which 500 patients were included in the study group with history of TC abuse on face and 500 patients were included in the control group with no history of application of TCs on the face, who attended the Dermatology OPD at HIMS Hassan, for a period of 20 months: Nov 2016 to Jun 2018.

All the patients who presented with facial dermatoses above 16 years of age with h/o TCs usage for a continuous period of 3 months in the last 6 months were included in the study group and those with facial dermatoses without a h/o using TCs were included in the control group. Patients using systemic steroids with psychiatric illness, using TCs for less than 3 months and who did not know about the cream they used, were excluded.

In both study and control group details of patients, reason for the use, brand of TCs and awareness of the side effects were noted. Photographic documentation of face was done in both the groups. Informed consent was documented and explained to the patient in his/her language.

Personality trait assessment was done using EYSENCK PERSONALITY INVENTORY (EPI) for participants of both the groups [5].

EYSENCK PERSONALITY INVENTORY consists of personality traits of Extroversion (E), Introversion (I), Neuroticism (N) and Lie score (L).

EPI consists of total 57 questions. Out of 57 questions, 24 questions belonged to Extroversion, 24 questions belonged to Neuroticism and 9 questions belonged to Lie score. Both group patients were asked to answer every question with a yes or no answer depending upon how they felt, thought and behaved naturally. Then the analysis of this data and interpretation of personality was done using the scoring key and norms provided with the EPI manual.

### 3.1 Statistical analysis

All the data were entered in Microsoft excel 2007 sheet for both the groups, statistical analysis was done using SPSS version 20 software. Descriptive statistics includes frequency & percentages and differential statistics includes Chi square test.

## 4. Results

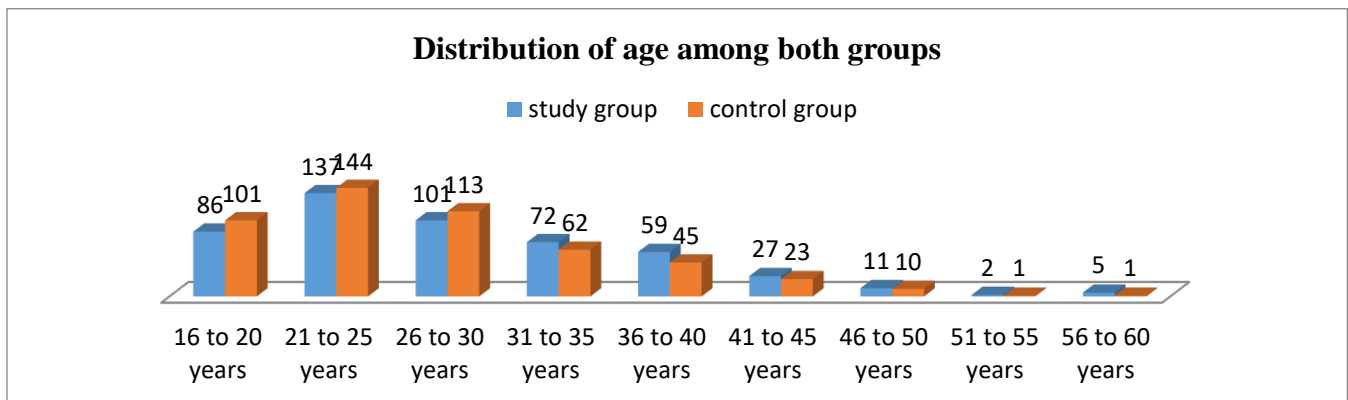
Total of 1000 patients were recruited in the study.

TABLE 1. Gender distribution among study and control group.

			Study group	Control group	'P' value
<b>GENDER</b>	Male	Frequency (%)	89 (17.8%)	110(22.0%)	0.09
	Female	Frequency(%)	411(82.2%)	390(78.0%)	

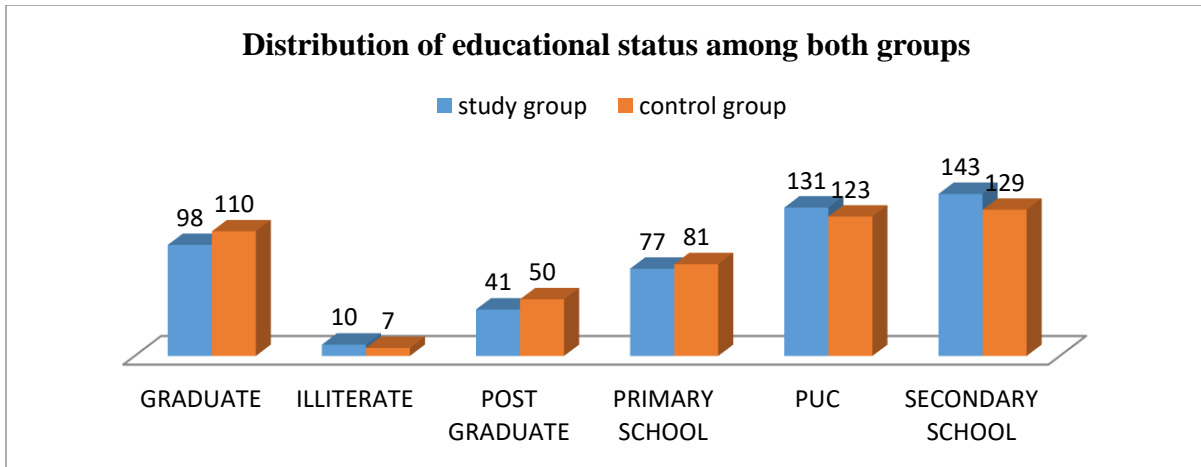
Distribution of age among both groups are shown in Graph-1 with no statistically significant difference between the groups ( $p=0.227$ ).

Graph-1



The educational status of patients in both the groups are shown in graph-2 ( $p=0.067$ ).

Graph-2



Distribution of socio-economic status among both groups with no statistical significant difference are shown in TABLE 2.

TABLE 2. Distribution of socio-economic status.

SOCIO ECONOMIC STATUS		Group		'P' value
		Study	Control	
Lower middle class	Frequency (%)	254 (50.8%)	274(54.8%)	0.370
Upper lower class	Frequency(%)	237 (47.4%)	220(44.0%)	
Upper middle class	Frequency(%)	9 (1.8%)	6(1.2%)	

Out of total 500 patients from study group most common reason for TC abuse was melasma in 180 (36.0%), followed by acne in 97 (19.4%) and skin lightening/fairness in 88 (17.6%), as shown in TABLE 3.

TABLE 3. Reason for TC abuse among study group.

REASON FOR TC ABUSE	Frequency (%)
Melasma	180 (36%)
Acne	97 (19.4%)
Skin lightening/ Fairness	88 (17.6%)
Scarring on skin	75 (15%)
Pigmentary skin conditions	40 (8%)
Acne & its pigmentation	16 (3.2%)
Facial dryness	14 (2.8%)
Tinea faciei / Tinea barbae	11 (2.2%)
Freckles (Blemishes)	6 (1.2%)
Suntan	6 (1.2%)
Nonspecific reasons-	3 (0.6%)

Note: Some patients had used TCs for more than one indication.

Most common source for TC use was from friends in 252 (50.4%) patients, followed by, family members in 53 (10.6%), then by pharmacists in 52 (10.4%) patients, as shown in TABLE 4.

**TABLE 4. Source of TC for abuse among study group.**

<b>SOURCE OF TC</b>	<b>Frequency (%)</b>
Friends	252 (50.4%)
Family member	53 (10.6%)
Pharmacist	52 (10.4%)
Self	45 (9%)
Neighbors	30 (6%)
General practitioners (G.P)/ Non allopathic doctors/ Rural doctors	23 (4.6%)
Physician (non dermatologist)	18 (3.6%)
Beauty parlor	14 (2.8%)
Dermatologist	8 (1.6%)
Attractive advertisement	3 (0.6%)
Paramedical personal- Nurse	2 (0.4%)
<b>Total</b>	<b>500 (100%)</b>

Most common TC brand used by the patients was Panderm plus cream (Ofloxacin 0.75%, Ornidazole 2%, Terbinafine 1%, Clobetasole Propionate 0.05%) by 177 (35.4%) patients, followed by Triple combination cream (containing Mometasone Furoate 0.1% + Hydroquinone 2% + Tretinoin 0.025%) by 128 (25.6%) patients, Betnovate cream by 123 (24.6%), Betnovate-C cream by 51 (10.2%), Clobetamil-G cream by 13 (2.6%) patients as depicted in the TABLE 5.

**TABLE 5. Brand names and composition of various TC formulations abused by the study patients.**

<b>Brands</b>	<b>Ingredients</b>	<b>No of patients</b>	<b>Class* of TCs</b>
Panderm Plus cream	Ofloxacin 0.75%, Ornidazole 2%, Terbinafine 1%, Clobetasole Propionate 0.05%	177	<b>I</b>
Clobetamil-G cream	Clobetasole propionate 0.05% Gentamicin sulphate 0.1%	13	
Lobate-GM cream	Clobetasol propionate 0.05%, Neomycin sulphate 0.5%, Miconazole nitrate 2%	8	
Dermi -5 cream	Clobetasol propionate 0.05% gentamicin 0.1% Tolnaftate 1% Idochlorhydroxyquiniline 1% Ketoconazole 2%	6	
Panderm-NM cream	Clobetasol propionate 0.05% Neomycin sulphate 0.5% Miconazole nitrate 2%	4	
Tenovate-GN cream	Clobetasol propionate 0.05% Neomycin sulphate 0.5%	4	
		<b>218</b>	

Tenovate cream	Clobetasol propionate 0.05%	3		
Eaten-G cream	Clobetasol propionate 0.05% Gentamycin 0.1%	1		
Tenovate-M cream	Clobetasole propionate 0.05% Miconazole nitrate 2%	1		
Terbinaforce-Plus cream	Clobetasol propionate 0.05% Ofloxacin 0.75% Ornidazole 2% Terbinafine 1%	1		
Betnovate cream	Betamethasone valerate 0.1%	123	<b>193</b>	<b>V</b>
Betnovate C cream	Betamethasone valerate 0.1% Clioquinol 3%	51		
Betnovate N cream	Betamethasone valerate 0.1%, Neomycin sulphate 0.5%	9		
Betnovate GM cream	Betamethasone valerate 0.1% Gentamicin sulphate 0.1% Miconazole nitrate 2%	10		
<b>Triple Combination</b> (Skinlite, Melacare, Skin Shine, HH lite, Melabest, Melalite-XL, Elosone-HT, Metasone-Plus, Lookbrite, Metacortil lite)	Mometasone Furoate 0.1% + Hydroquinone 2% + Tretinoin 0.025%	128	<b>137</b>	<b>IV</b>
Momate cream	Mometasone Furoate 0.1%	6		
HH-sone cream	Mometasone Furoate 0.1%	3		
Diprovate –G cream	Betamethasone Dipropionate 0.05%+ Gentamycin 1%	4		
Candid B cream	Betamethasone Dipropionate 0.05%+ Clotrimazole 1%	1	<b>6</b>	<b>III</b>
Flutopic Skin ointment	Fluticasone Propionate Ointment 0.005%	1		

Note: Many patients used multiple TCs creams of different potencies.

Class\*- potency of TCs by USA classification.

Most common type of TC abused was class-1 (super potent) clobetasol propionate 0.05% cream either alone or in combination with antifungal and/ antibacterial agent in 218 (43.6%) patients, followed by class-5 TC (Lower Mid Strength class) containing Betamethasone valerate 0.1% in 193 (38.6%) patients.

Most common reason for continued use for TC was exacerbations of symptoms on stopping steroid cream in 487 (97.4%) followed by improvement in skin color in 13 (2.6%) patients. Out of total 500 patients from study group, only 2 (0.4%) patients were aware of the side effects of TC abuse. Localized side effects seen are shown in the TABLE 6.

TABLE 6. Localized side effects after TC abuse.

	Frequency (%)
Acneiform eruption and acne aggravation	171 (34.2%)
Photosensitivity	161 (32.2%)
Hyperpigmentation	158 (31.6%)
Hypertrichosis	66 (13.2%)
Topical steroid dependent face	38 (7.6%)
Perioral dermatitis	29 (5.8%)
Atrophy	24 (4.8%)
Telangiectasia	23 (4.6%)
Tinea incognito (tinea faciei)	9 (1.8%)
Rosacea	5 (1%)
Hypopigmentation	5 (1%)

Note: Many patients had more than one localized side-effect.

Personality traits of Extroversion, Neuroticism, Introversion and Overlap were assessed among both study and control group patients. The results were as shown in TABLE 7 with no statistical significant difference between the groups.

Lie score was seen in total 39 (7.8%) patients in study group and 43 (8.6%) patients in control group. Those who scored on any of the traits with lie score were excluded from inclusion in their respective groups and analysis.

TABLE 7. Distribution of personality traits among study group and control group with Lie score.

		Group	
		Study	Control
<b>PERSONALITY TRAITS</b>	<b>E</b>	4 (0.8%)	5(1%)
	<b>N</b>	267(53.4%)	232(46.4%)
	<b>I</b>	22(4.4%)	28(5.6%)
	<b>E,N</b>	13(2.6%)	9(1.8%)
	<b>I,N</b>	15(3%)	20(4%)
	<b>STABLE</b>	140(28%)	163(32.6%)
<b>LIE SCORE</b>	<b>L</b>	23(4.6%)	17(3.4%)
	<b>E,L</b>	1(0.2%)	0(0%)
	<b>N,L</b>	12(2.4%)	16(3.2%)
	<b>I,L</b>	0	8
	<b>E,N,L</b>	2	0
	<b>I,N,L</b>	1	2
<b>Total</b>		<b>500 (100%)</b>	<b>500 (100%)</b>

E- Extroversion, N- Neuroticism, I- Introversion, L- Lie score

After excluding the lie scorers, we have personalities among both groups like E; N; I; Stable and overlap of E,N; I,N with no statistical significant difference between the groups as shown in TABLE 8.

**TABLE 8. Distribution of personality traits among study group and control group excluding the Lie score.**

Chi square test			
PERSONALITY	Group		'P' value
	Study	Control	
<b>E</b>	4 (0.8%)	5 (1%)	0.263
<b>N</b>	267 (53.4%)	232 (46.4%)	
<b>I</b>	22 (4.4%)	28 (5.6%)	
<b>E,N</b>	13 (2.6%)	9 (1.8%)	
<b>I,N</b>	15 (3%)	20 (4%)	
<b>STABLE</b>	140 (28%)	163 (32.6%)	

E- Extrovert, N- Neurotic, I- Introvert, L- Lie score

However, there was a statistically significant difference among the males and females within the study group as shown in TABLE 9.

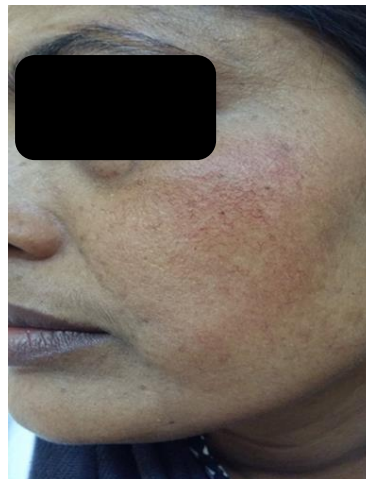
**TABLE 9. Distribution of personality traits among the males & females in the study group.**

PERSONALITY	STUDY Group		'P' value
	FEMALE	MALE	
<b>E</b>	2(50%)	2(50%)	0.022
<b>N</b>	228(85.39%)	39(14.61%)	
<b>I</b>	19(86.4%)	3(13.6%)	
<b>EN</b>	10(76.92%)	3(23.08%)	
<b>IN</b>	14(93.33%)	1(6.67%)	
<b>STABLE</b>	103(73.57%)	37(26.43)	





**FIG. 1. A 45-year-old female who developed acneiform eruptions and aggravation of the same after 2 years of TC abuse for fairness.**



**FIG. 2. A 36-year-old female developed Telangiectasia after 8 years of TC abuse; used for the treatment of facial dryness.**



**FIG. 3. Acne vulgaris and post inflammatory hyperpigmentation in control group.**



**FIG. 4. A 30-year-old female with melasma in the control group.**

## **5. Discussion**

TCs first came into existence 50 years ago, marking the most important milestone in dermatologic therapy owing to potent anti-inflammatory and anti-proliferative effects [6,7,2]. Ever since, there has been a widespread misuse of TC as fairness creams and anti-acne agents. Multiple studies have been reported from India focusing on the same issue [8-16].

Out of 500 patients from the study group, majority i.e., 411 (82.2%) were females, similar to study by Saraswat et al [13], Bains et al [14], Jha et al [15] and Brar et al [16]. TC abuse is greater among females when compared to males is probably due to the wider prevalence of cosmetic consciousness among them, limited access to medical treatments for facial dermatoses and they are often misled that TCs are fairness or an anti-acne cream.

Most frequent age group was 21-25 years in 137 (27.4%) patients, followed by 26 to 30 years 101(20.2%). In a study by Saraswat et al [12], 36% belonged to age group of 21-30 years. This could be due to the fact that younger population are socially more active, want to look attractive among the peers and are unaware of the negative repercussions of TC misuse.

Majority of the patients, 143 (28.6%) were educated till secondary school level education, 131 (26.2%) patients educated 11<sup>th</sup> to 12<sup>th</sup> standard, which is similar to study by Bains P et al [13] and Chohan SN et al [9] were secondary school education was seen in 48% and 64% respectively which was higher than our study. Less education status in our study could be a reason for abuse of TCs because of lack of awareness and knowledge about the medication and its ill effects of continuous use.

Most patients belonged to lower socio-economic status [17,18], similar to the study done by Chohan SN et al [9]. This also could have contributed to TC abuse as affordability to quality doctors and quality treatment was not there.

The most common reason for TCs abuse was melasma 180 (36%), acne 97 (19.4%) and as fairness cream 88 (17.6%) patients, similar to study by Bains P et al [14]. This result further highlights the deep seated mindset of the Indian population that fair is beautiful and in the pursuit of fair, clear, and blemishless skin, majority of them fall in the trap of TCs.

The commonest source for recommendation of TCs abuse were friends and family members in 50.4% and 10.6% respectively, mainly because of easy sharing and copying of TC containing creams. Similar findings were seen in various studies [7,13] and the incidence was quite high at 64% in a study from Pakistan [4] and at 51% by Brar KB et al [16] study.

Panderm plus cream containing Clobetasol propionate 0.05%, super potent class 1 TC was used by majority of the patients in our study in 177 (35.4%), followed by Betnovate cream containing Betamethasone valarate 0.1%, class 5 Lower Mid-Strength TC was used by 123 (24.6%) patients. Overall most common TC molecule used was Clobetasol propionate 0.05% in cream form used either plain or in various combinations of various antibacterial and or antifungal agents in 218 (43.6%) followed by Betamethasone valarate 0.1% cream used either plain or in various combinations of antibacterial and or antifungal agents in 193 (38.6%) patients. When compared with other studies by Bains P et al [14], Betnovate cream was most commonly used in 49% cases, this percentage is higher than our study, second most common TC molecule used was clobetasol propionate 0.05% cream in 40% patients. Similar results were seen in studies by Inakanti Y et al [11]; Saraswati et al [13], Jha et al [15] and Chohan SN et al [4]. The reason for this difference in Panderm plus cream in our study and Betnovate cream in other studies could be due to the prescription pattern of the local doctors, popularity of the brands in our region and easy availability of this product OTC. Both these molecules are highly potent topical corticosteroids and are known to produce adverse effects when used inappropriately and for a long duration.

The commonest reason for continued use of TCs was exacerbation of symptoms on stopping the steroid cream application in 487 (97.4%) patients and improvement in the skin color in 13 (2.6%) patients; similar to study by Rathi S et al [3]. Majority of patients 498 (99.6%) were unaware of the side effects of TC abuse. Though color discrimination seems to be a talk of history in most of the developed countries, it still prevails quite significantly, especially amongst the women in our region.

Most common adverse effects seen was acneiform eruption and acne aggravation in 171 (34.2%) patients (TABLE 6), similar to that of studies by Bhat Y J et al [7] and Brar K B et al [16] where 35% and 56% patients developed acneiform eruption respectively. Saraswati et al [13] and Inakanti Y et al [11] observed high incidence of acneiform eruption in their study of 57.5% and 88.5% respectively. It was observed that on short term use, the TCs had good results in controlling acne while it worsened on continuous long-term application. 7.6% of patients developed TSDF which was characterized by development of persistent pin point, red colored papules, pustules and nodules, with telangiectatic vessels and firm edematous skin [6]. TSDF and rebound phenomenon is explained by the sudden cessation of vasoconstrictor effect and release of proinflammatory cytokines on withdrawal of TCs [6]. This finding of TSDF in our study was almost similar to other studies by Brar KB et al [16] and Chohan SN et al [4] with 26% and 32.5%, TSDF patients respectively.

We found no statistically significant difference in the personality traits of neuroticism, extroversion, and introversion between the study group and control group. This indicates that personality factors do not influence patients with dermatological conditions to abuse TCs. However, neurotic traits were seen in majority of patients in both the groups. Interestingly, it was also noted that there was a statistically significant difference among the males and females within the study group i.e., more females in the study group had personality traits of neuroticism, extroversion, and introversion. This indicates that the sex of the patient plays a role in TCs abuse. This can be attributed to the fact that women are drawn towards greater beauty standards, one of them being fairness. To the best of our knowledge, there is no study till date which has assessed this aspect in TC abusers.

India is a country of colors, where we live in a society that defines beauty by fairness! Dark skinned individuals face unwarranted pressure to live up to the standards of the society where everyone wishes to be *fair skinned* and will do anything to lighten their *skin*. It is believed that fairness brings more job opportunities or promotions, better marriage proposals and ultimately better quality of life. History can explain some of our fascination for lighter skin. Skin color was a reflection of social standing where a lighter skin tone implied that the person worked less under the sun. Years of colonial rule reinforced the notion that fairness came with privileges. The Mughals, Dutch, French and the British, who ruled us were born with lighter complexion hence fairness was associated with more power. This history is being carried forward into modern times till now, even the media has contributed significantly as they often portray a fair skinned individual as the epitome of beauty.

## 6. Conclusion

Based on the results obtained from our study, TC abuse was seen most commonly among females, in a relatively younger age group, having lesser education and with lower socio-economic status. Recommendation by friends was the most common influencing factor for TC abuse. Commonest TC abused was clobetasol propionate and the commonest sign seen after TC abuse was acneiform eruption and acne aggravation. Personality factors were a contributing factor for the TC abuse among the females in our study group. This study throws a light on how external appearances influences the younger population, especially females.

## 7. Declaration/Conflict of Interests

None

## 8. Funding Sources

None

Institutional Ethics approval was obtained from the Institutional Ethical Committee, Hassan Institute of Medical Sciences

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