# **Original Research Article**

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# A cross-sectional study to document socio-demographic profile and disease profile of dermatosis in pediatric age group

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#### **ABSTRACT**

**Background:** Skin diseases are considered a major health problem in the pediatric age group and are sometimes associated with significant morbidity. Among them, dermatosis is one of the most common skin diseases in India, affecting the skin and hair. Early diagnosis and treatment are essential for pediatric patients to prevent long-term persistence or disability caused by the disease. Although some manifestations are physiological and require no treatment, different age groups have different sets of clinical dermatoses, with dermatitis being the most common among all age groups. Studying the proportions of various clinical presentations of different types of dermatosis helps in the proper diagnosis and management of patients. This study was conducted to document the socio-demographic profile and disease profile of various forms of pediatric dermatosis.

**Methods:** A cross-sectional study was conducted from April 2017 to March 2019 among 401 pediatric patients at a tertiary-level hospital.

**Results:** Out of the 401 participants, approximately two-thirds were male, and more than half (53.1%) were 5-11 years old. Among the dermatoses groups, the most common were dermatitis (20.4%), nutritional (15%), pigmentary (13.6%), and others.

**Conclusions:** All forms were predominantly seen among males, except in a few dermatitis types like papulosquamous, hair, pigmentary, bullous, and keratinizing disorders, where females were more prone than males.

Keywords: Paediatric, Dermatosis, Skin disease, Hair disease

# INTRODUCTION

Dermatology evolved as a branch of internal medicine during the 19<sup>th</sup> century. It encompasses the study not only of the skin and its diseases but also of the external and internal factors, including psychological influences, that cause or contribute to such diseases. J. L. Burton rightly said, "Skin is a mirror of the soul." Skin diseases were considered a major health problem among pediatric patients, with significant morbidity if left untreated. They constitute 30% of all outpatient visits to pediatricians, and 30% of all visits to dermatologists involve children.<sup>1,2</sup>

The manifestations of skin diseases in the pediatric age group vary between transitory or chronic and recurrent. Chronic dermatoses are often associated with significant morbidity and psychological impact. Pediatric dermatoses and adult dermatoses have different manifestations, requiring a separate approach from adult dermatoses. According to various studies, dermatoses in pediatric patients are affected by socioeconomic conditions, climate change, nutritional habits, and the external atmosphere compared to adults. Cutaneous infections are common in children during school-going years.<sup>3</sup>

In India, 28.6% of the population is less than 14 years of age. In the last two decades, pediatric dermatology has become a vital field of medical practice encompassing numerous areas of expertise. It exclusively deals with the skin diseases prevalent in children, some of which often follow clinical courses quite variable from those in adults due to anatomical and physiological variations in pediatric skin, differences in immune status, endocrine status, and other factors. Sometimes, the skin may reflect internal diseases such as the presence of cyanosis, jaundice, pallor, purpura, hypothermia, and hyperthermia, which may indicate other diseases.<sup>4,5</sup>

Most of the data on pediatric dermatoses derive from school-based surveys of urban and rural areas of India. It has been reported that the pattern of skin diseases in India differs across states, rural and urban areas, and hilly regions. A.5 Treatment is also considered a vital aspect of managing pediatric dermatoses. It requires extensive knowledge regarding drugs, their accurate dosages, adverse effects, and contraindications. Prescribing topical preparations to pediatric patients requires great expertise, which depends on the site, age, preparation, type of dermatoses, etc. Hence, the present study was performed with the objectives of documenting the sociodemographic profile, clinical profile, and gender-wise distribution of various forms of pediatric dermatosis.

## **METHODS**

The present observational cross-sectional study was conducted in the outpatient department of the department of dermatology, new civil hospital, Surat, from April 2017 to March 2019 after obtaining ethical approval. Data were collected using a pre-designed, semi-structured questionnaire, which consisted of socio-demographic profiles, clinical profiles, associated symptoms, drug history, and various laboratory tests if necessary, such as complete blood count, random blood sugar, liver function tests, renal function tests, urine examination, peripheral blood smear, skin biopsy, X-ray chest, USG abdomen, and other necessary relevant investigations. Participants were informed that their participation was strictly voluntary and that they could withdraw at any time. After data collection, all data were entered and analyzed using Microsoft office excel 2007. Quantitative data were presented with mean and SD, while qualitative data were presented with frequency and percentage. Bar diagrams were used for graphical presentation.

#### Inclusion criteria

Patients with age >1 month and <12 years, patient having dermatoses and patient's guardian willing to give informed valid consent were included.

# Exclusion criteria

Patients with age <1 month and >12 years, infectious disease and not willing to participate were excluded.

#### **RESULTS**

The present cross-sectional study among 401 participants found that the majority of patients belonged to the age group of 5-11 years (53.1%), followed by 1-5 years (33.8%) and less than one year (13.1%). More than half of the patients (55.9%) were boys, with a sex ratio of 1.3:1. The majority of patients (81%) attending the skin OPD were from nuclear families, while 89% resided in pucca houses, and the majority were in socioeconomic class III (45.5%) and class IV (27%). Approximately three-fifths of patients (59.4%) originally belonged to other states and migrated to Surat.

A total of 66 different non-infectious dermatoses were found among patients, with dermatitis (20.42%) being the most common, followed by nutritional dermatoses (15.2%), pigmentary dermatoses (13.62%), lichenoid dermatoses (9.39%), keratinization disorders (7.51%), and others.

Among dermatitis, the most common forms of disorders were acute eczema (45.9%), atopic dermatitis (20.6%), seborrheic capitis and dermatitis (14.8%), and others. Among nutritional dermatoses, the most common disorders were pityriasis alba (57.8%), phrynoderma (25%), and others. The most common pigmentary disorder was vitiligo (61.8%), and the most common lichenoid disease was lichen planus (52.5%). Palmoplantar keratoderma (37.5%) was the most common keratinization disorder, while hemangioma (25.5%) was the most common nevoid disease, and pityriasis rosea (38.4%) was the most common papulosquamous disorder.

Among hair diseases, the commonest conditions were alopecia areata (60%), alopecia universalis (12%), tractional alopecia (12%), and others. The most common urticarial and bullous disorders were Popular urticaria (65%) and chronic bullous disease of childhood (62.5%) respectively. However, the commonest miscellaneous conditions were miliaria (44.1%), milia (11.7%), and others (Table 2).

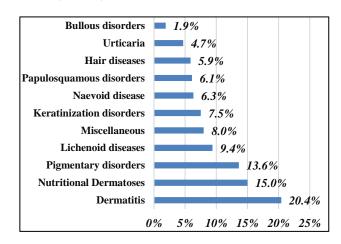


Figure 1: Distributions of pediatric patients based on groups of dermatoses.

Table 1: Distributions of patients based on socio-demographic profiles.

Socio-demographic variables		N (%)	
	_ ≤1	56 (13.1)	
Age group (in years)	1-5	144 (33.8)	
	5-11	226 (53.1)	
Gender	Male	224 (55.9)	
Gender	Female	177 (44.1)	
Family types	Nuclear	326 (81.2)	
Family types	Joint	75 (18.8)	
Types of house	Kutcha house	43 (10.8)	
Types of nouse	Pucca house	358 (89.2)	
	1 room	141 (35.2)	
No. rooms in house	2 rooms	198 (49.5)	
	3 or more rooms	62 (15.2)	
	Gujarat	163 (40.6)	
	Bihar	63 (15.7)	
	UP	116 (29.1)	
Native place	Maharashtra	41 (10.3)	
	MP	5 (1.1)	
	Orissa	3 (0.7)	
	Rajasthan	10 (2.3)	
	I	3 (0.7)	
	II	78 (19.5)	
Socio-economical class	III	183 (45.5)	
	IV	108 (27.0)	
	V	29 (7.3)	

Table 2: Distributions of patients based on group of dermatosis and disorder.

Dermatosis	Disorder	Male, N (%)	Female, N (%)	Total, N (%)
Dermatitis (n=87)	Acute eczema	22 (44.0)	18 (48.6)	40 (45.9)
	Atopic dermatitis	12 (24.0)	6 (16.2)	18 (20.6)
	Seborrheic capitis	3 (6.0)	4 (10.8)	7 (8.0)
	Seborrheic dermatitis	4 (8.0)	2 (5.4)	6 (6.8)
	Irritant contact dermatitis	5 (10.0)	0	5 (5.7)
	Pompholyx	2 (4.0)	3 (8.1)	5 (4.7)
	Diaper dermatitis	1 (2.0)	3 (8.1)	4 (4.5)
	Erythroderma	1 (2.0)	1 (2.7)	2 (2.2)
	Pityriasis alba	23 (59.0)	14 (56.0)	37 (57.8)
	Phrynoderma	10 (25.6)	6 (24.0)	16 (25.0)
Nutritional	Acrodermatitis enteropathica	2 (5.1)	1 (4.0)	3 (4.7)
dermatoses (n=64)	Chelitis/stomatitis	1 (2.6)	2 (8.0)	3 (4.6)
	Protein-energy malnutrition	1 (2.6)	2 (8.0)	3 (4.6)
	Koilonychias	2 (5.1)	0	2 (3.1)
	Vitiligo	19 (61.3)	15 (55.6)	34 (61.8)
Pigmentary disorders (n=58)	Hypomelanosis of Ito	1 (3.2)	3 (11.1)	4 (7.2)
	Nevus depigmentosus	2 (6.5)	2 (7.4)	4 (7.2)
	Post-inflammatory hyperpigmentation	3 (9.7)	1 (3.7)	4 (7.2)
	Albinism	2 (6.5)	0	2 (3.6)
	Mongolian spot	1 (3.2)	1 (3.7)	2 (3.6)
	Lentigens	2 (6.5)	0	2 (3.6)
	Freckles	1 (3.2)	1 (3.7)	2 (3.6)
	Waardenberg syndrome	0	2 (7.4)	2 (3.6)
	Dyschromatosis universalis hereditaria	0	1 (3.7)	1 (1.8)
	Incontinentia pigmenti	0	1 (3.7)	1 (1.8)

Continued.

Danie danie	Discolar	Male,	Female,	Total,
Dermatosis	Disorder	N (%)	N (%)	N (%)
Lichenoid diseases (n=40)	Lichen planus	15 (48.4)	6 (66.7)	21(52.5)
	Lichen striatus	6 (19.4)	2 (22.2)	8 (20.0)
	Lichen nitidus	5 (16.1)	1 (11.1)	6 (15.0)
	Lichen spinulosus	5 (16.1)	0	5 (12.5)
Keratinization disorders (n=32)	Palmoplantar keratoderma	4 (26.7)	8 (47.1)	12 (37.5)
	Keratosis pillaris	1 (6.7)	7 (41.2)	8 (25.0)
	Ichthyosis vulgaris	7 (46.7)	1 (5.9)	8 (25.0)
	Lamellar ichthyosis	3 (20.0)	1 (5.9)	4 (12.5)
	Hemangioma	3 (17.6)	4 (40.0)	7 (25.5)
	Port wine stain	3 (17.6)	2 (20.0)	5 (18.5)
NI!A 4!	Salmon patch	4 (23.5)	1 (10.0)	5 (18.5)
Naevoid disease (n=27)	Congenital melanocytic nevus	3 (17.6)	0	3 (11.1)
	Linear epidermal verrucous nevus	0	3 (30.0)	3 (11.1)
	Blaschkitis	2 (11.8)	0	2 (7.4)
	Faun tail	2 (11.8)	0	2 (7.4)
	Pityriasis rosea	3 (23.1)	7 (53.8)	10 (38.4)
	Psoriasis vulgaris	4 (30.8)	2 (15.4)	6 (23.0)
Papulosquamous	Guttate psoriasis	3 (23.1)	2 (15.4)	5 (19.2)
disorders (n=26)	Pityriasis rubra pilaris	1 (7.7)	1 (7.7)	2 (7.6)
	Keratolysis exfoliative	2 (15.4)	0	2 (7.6)
	Scalp psoriasis	0	1 (7.7)	1 (3.8)
	Alopecia areata	8 (66.7)	7 (53.8)	15 (60.0)
Hair diseases (n=25)	Alopecia universalis	0	3 (23.1)	3 (12.0)
	Traction alopecia	1 (8.3)	2 (15.4)	3 (12.0)
	Lichen plano pilaris	2 (16.7)	0	2 (8.0)
	Pityriasis amiantacea	0	1 (7.7)	1 (4.0)
	Trichotillomania	1 (8.3)	0	1 (4.0)
Urticaria (n=20)	Papular urticaria	6 (50.0)	7 (87.5)	13 (65.0)
	Acute urticaria & angioedema	5 (41.7)	1 (12.)	6 (30.0)
	Cutaneous mastocytosis	1 (8.3)	0	1 (5.0)
<b>Bullous disorders</b>	A chronic bullous disease of childhood	2 (50.0)	3 (75.0)	5 (62.5)
(n=8)	Epidermolysis bullosa simplex	2 (50.0)	1 (25.0)	3 (37.5)
Miscellaneous (n=34)	Miliaria	7 (35.0)	8 (57.1)	15 (44.1)
	Milia	0	4 (28.6)	4 (11.7)
	Morphea	3 (15.0)	0	3 (8.8)
	Cutis marmorata	3 (15.0)	0	3 (8.8)
	Polymorphic light eruption	3 (15.0)	0	3 (8.8)
	Fordyces spot	1 (5.0)	1 (7.1)	2 (5.8)
	Infantile acne	1 (5.0)	0	1 (2.9)
	Anhidrotic ectodermal dysplasia	1 (5.0)	0	1 (2.9)
	Neurofibromatosis -1	1 (5.0)	0	1 (2.9)
	Tuberous sclerosis	0	1 (7.1)	1 (2.9)

# **DISCUSSION**

Patterns of dermatological disorders among pediatric patients differ from one nation to another and within the same nation from one state to another due to various factors such as climate, culture, and socioeconomic factors. Cutaneous infections are most common among school-going pediatric patients. The majority of dermatological conditions arising from intrinsic genetic abnormalities also have onset in the pediatric age.

The present study found that school-going children were more vulnerable to pediatric dermatoses, with boys at

higher risk than girls with a ratio of 1.3:1. The majority of children belong to nuclear families. Similarly, other studies have reported a male-female ratio between 1.2:1 to 1.4:1.<sup>6,7</sup> Family health survey (NFHS) data suggest that nuclear families are gradually becoming the predominant form of the Indian family institution, at least in urban areas.<sup>8</sup> The current study revealed that the majority of children belonged to socioeconomic class (Modified Prasad) III, while the majority of children lived in pucca houses with 2 rooms. Similar findings were reported in SRS data, where in urban Gujarat, people living in 2-room and 1-room houses were 34.6% and 50.1%,

respectively, which was against national data of 31.3% and 40%, respectively.<sup>9</sup>

The current study identified 66 types of non-infectious pediatric dermatosis cases among children. Among them, dermatitis was the most common, followed by nutritional dermatoses, pigmentary dermatoses, lichenoid dermatoses, etc. Similar findings were reported by Karthikeyan et al and Jawade et al, while Sacchidanand et al found 20.2% eczema in their study.<sup>7,10,11</sup>

# Atopic dermatitis

The present study reported various endogenous and exogenous eczematous dermatoses. Among them, acute eczema was most common (45.9%), followed by atopic dermatitis (20.6%), seborrheic capitis (8%), etc. This relatively high frequency of atopic dermatitis in children may be due to environmental and genetic factors. The diagnosis was done using Hanifin and Rajka's criteria. Nine patients out of 18 had a history of asthma or allergic rhinitis in their mother or father, five patients had multiple episodes to date, eight had winter aggravation, and all patients had dry skin and flexural involvement. Karthikeyan et al and Jawade et al reported a prevalence of dermatitis of 6.8% and 4.3%, respectively.<sup>7,10</sup>

#### Nutritional dermatoses

In this study, a very high prevalence of nutritional dermatoses was around 15%. Among them, pityriasis alba was most common (57.8%), followed by phrynoderma (25%), acrodermatitis enteropathica (4.7%), cheilitis/stomatitis (4.6%), and protein energy malnutrition (4.6%). Other studies have reported an incidence of nutritional dermatoses of 15.4% to 17.5%. <sup>12</sup>

# Pigmentary disorder

In the present study, pigmentary disorders accounted for 13.6% of cases, and most of the children were suffering from vitiligo (61.8%), which was similar to a study conducted by Jawade et al and Hasan et al, Balai et al reported 21 patients with pigmentary disorders out of 1000 patients, with 6 patients having vitiligo.<sup>7,13,14</sup>

# Hair disorder

The current study demonstrates only 5.9% of hair disorders, with the most common being alopecia areata (60%), followed by alopecia universalis (12%), tractional lichen alopecia (12%),plano pilaris trichotillomania (4%), and pityriasis amiantacea (4%). The majority fall in the age group of 6 to 11 years. The further current study found a total of 15 patients with alopecia areata, out of which three patients had nail changes, one had a history of thyroid in her mother, and two patients had a second episode of alopecia areata, while 13 children had patchy type alopecia areata and 2 had ophiasis pattern. However, a study done by Tan et al. found a prevalence of 3.8% for alopecia areata in their study in Singapore. 15

#### Urticaria

The present study identified 20 cases of allergic dermatitis, among them, popular urticaria was the most common (65%). A study done by Ghosh et al. also found papular urticaria among 4% of patients. The fact that most of these children were from rural or semi-urban areas and wore scanty clothing due to climatic conditions and being exposed to insect bites could explain such a high frequency of papular urticaria.<sup>16</sup>

#### Others dermatoses

The current study reported very few cases of nevi and hemangioma among miscellaneous cases. While Thappa et al found melanocytic nevi in 0.5% of patients and Dogra et al. reported 1.1%.5 In vascular nevi, hemangioma was the most common and found below 1 year. 10,15 The present study reported 5.6% of papulosquamous disorders, in which psoriasis (2.8%) was most common, followed by pityriasis rosea. A similar result was reported by Sacchidanand et al (6.08%). 11 This study reported bullous disorder in 1.87% of cases, while some studies have reported it in 0.6% to 4.65% of cases. 17,18 Among the keratinization disorders. Palmoplantar keratoderma (2.82%), keratosis pilaris, ichthyosis vulgaris (1.88%), and lamellar ichthyosis (0.94%) were found in the present study, which was comparable to Thappa et al.<sup>2</sup> In the current study, 9.4% of cases were reported as lichenoid disorders, among them, the most common was lichen planus, followed by lichen striatus, lichen nitidus, and lichen spinulosus. Similar findings were reported by Karthikeyan et al and Venkata Subba Reddy et al. 10,18

#### Limitations

One limitation of this study is its cross-sectional design, which only provides a snapshot of the socio-demographic profile and disease profile of dermatosis in the pediatric age group. Additionally, the study population was limited to patients from a specific tertiary healthcare hospital in South Gujarat, which may restrict the generalizability of the findings to other populations or settings. Further research involving larger and more diverse populations is crucial to validate and build upon the findings of the cross-sectional study.

### **CONCLUSION**

Pediatric dermatoses have a wide variety of manifestations. They affect mostly school-going boys belonging to socioeconomic class III. Furthermore, atopic dermatitis was the most common type of pediatric dermatosis among children. Early diagnosis and treatment are very useful for preventing pediatric dermatoses from becoming a major public health problem.

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Institutional Ethics Committee

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