

# Incidence and Clinical Pattern of Dermatoses in Children Attending the Tertiary Health Care Centre

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## ABSTRACT

**Background:** Dermatological conditions are prevalent among school-age children due to their delicate skin and increased vulnerability to infections and allergens. Such disorders induce significant discomfort in the affected child and considerably influence the overall quality of life for both the child and their family. It is imperative to comprehend the patterns of dermatoses within this demographic to facilitate effective treatment and management approaches.

**Methods:** Children aged between 5 to 14 years presenting with dermatological conditions at the dermatology outpatient department were included in this study. A pre-structured proforma was utilized to document all cases. A comprehensive medical history was obtained. Clinical assessment and pertinent laboratory investigations were conducted to verify diagnosis in cases of uncertainty.

**Results:** The study comprised a total of 1631 patients. The male children were predominantly represented, particularly within the 11-14-year age group, which exhibited a higher percentage in our study population. The most frequently observed conditions were infections and infestations. The subsequent common dermatoses were eczema disorders, followed by sebaceous, hypersensitivity, pigmentation, cornification, papulosquamous, hair and nail disorders, vesiculobullous and insect bite reaction. Among the infections and infestations, parasitic infestations were the most prevalent (18.1%), followed by fungal infections (16.2%), bacterial infections (9.6%), and viral infections (5.2%). Pityriasis alba emerged as the most common eczematous condition (4.4%).

**Conclusion:** The predominant pattern of dermatoses identified in our study was infestations and infections, succeeded by eczematous disorders. An in-depth understanding of the dermatosis pattern among school-aged children will facilitate the implementation of crucial modifications in health education and disease control strategies in the respective region, thereby mitigating skin-related ailments in children.

**Key-words:** Children, Infestation, Infection, Bacterial, Fungal, Virus, Dermatoses, Eczematous, Disorder

## INTRODUCTION

Skin disorders represent a considerable health concern within the pediatric population internationally. The incidence of these disorders is experiencing an upward trajectory and exhibits variability across diverse geographical regions, attributable to environmental

changes, varying hygiene practices, socio-cultural norms, and genetic predispositions.

Pediatric dermatoses encompass an array of skin disorders shaped by variables such as age, socioeconomic factors, and environmental contexts. The frequency and nature of these dermatoses demonstrate considerable variation across distinct demographic groups and geographical locations.

A research investigation conducted in Northeast India revealed that 34% of pediatric patients exhibited infective and infestation dermatoses, with scabies (29.92%) and impetigo (20.45%) emerging as the most prevalent forms <sup>[1]</sup>. In another study, bullous impetigo

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was found to be particularly prevalent among preschool-aged children, whereas older pediatric populations frequently presented with genital scabies and tinea cruris [2]. Eczematous conditions constituted 32.7% of cases in a South Indian study, with atopic dermatitis notably prevalent within this cohort [3]. Furthermore, nutritional deficiencies were identified in 15% of children, underscoring a correlation between health outcomes and socioeconomic status [4].

Infectious and infestation, inflammatory, and hypersensitivity dermatoses were identified as common classifications of skin disorders. In a study conducted in Northeast India, bullous impetigo was notably the most frequent condition among preschoolers, while genital scabies and tinea cruris were predominantly observed in adolescent populations [5]. Atopic dermatitis and psoriasis are frequently diagnosed among children, with atopic dermatitis typically manifesting before age five [6]. In summary, the clinical landscape of dermatoses in Indian children is heterogeneous, characterized by a significant prevalence of both infectious and non-infectious conditions, often exacerbated by socioeconomic adversities. Nonetheless, certain studies indicate a growing recognition of atopic conditions, suggesting an evolution in environmental influences.

Acquiring a comprehensive understanding of the dermatosis patterns within this age group is critical for developing effective treatment and management protocols. A thorough comprehension of the dermatosis patterns in school-aged children across various geographical regions can facilitate the implementation of essential revisions in health education and disease prevention strategies pertinent to the specific locale. This, in turn, can potentially enhance children's mental and physical health development.

## MATERIALS AND METHODS

**Research Design-** This study was cross-sectional observational research conducted in a dermatology outpatient department (OPD) at a tertiary healthcare center over one year. The objective of the research was to investigate the prevalence of dermatological disorders in pediatric patients aged between 5 to 14 years. The study aimed to provide a comprehensive understanding of the types and distribution of dermatological conditions in this age group. A structured approach was employed in gathering data, ensuring accuracy and

consistency throughout the study period. The research involved reviewing the medical records of pediatric patients presenting with dermatological issues during the study duration.

The design involved utilizing a pre-structured pro forma to collect patient data systematically. This allowed for detailed documentation of clinical signs, symptoms, medical history, and diagnostic investigations, ensuring all relevant data points were covered. Diagnoses were established by experienced dermatologists based on a thorough patient history, physical examination, and diagnostic testing where necessary. The study focused on a diverse range of dermatological conditions, including common skin diseases, allergic conditions, and rare dermatological disorders, with the ultimate goal of understanding the distribution and patterns of these diseases in children.

### Inclusion and Exclusion Criteria

Inclusion criteria were as follows:

- ✚ Pediatric patients aged between 5 to 14 years.
- ✚ Patients presenting with dermatological disorders at the dermatology OPD during the study period.
- ✚ Patients whose diagnosis was confirmed through clinical examination and/or relevant diagnostic tests, as determined by the attending dermatologist.
- ✚ Only cases that required active medical intervention were included.

### Exclusion criteria were:

- ✚ Patients below the age of 5 years or above the age of 14 years.
- ✚ Patients with incomplete or insufficient medical records or whose data were unavailable.
- ✚ Patients with primary dermatological conditions for which diagnosis could not be confirmed by clinical or laboratory investigations.
- ✚ Individuals who did not provide informed consent or had a parent or guardian unable to consent on their behalf.
- ✚ Cases where the diagnosis was not related to dermatological conditions (e.g., systemic diseases affecting the skin).

The inclusion and exclusion criteria were strictly adhered to ensure a homogeneous sample group that would provide valid and reliable results.

**Statistical Analysis-** The study analyzed the prevalence and distribution of dermatological disorders in children aged 5 to 14 years using SPSS software. Data were organized in MS Excel and summarized through descriptive statistics, including frequency, percentage, and mean. Comparative analyses assessed relationships between disease occurrence and demographic factors, with a p-value < 0.05 considered significant. The analysis

aimed to highlight dermatological health trends and areas of concern in the pediatric population.

**Ethical Approval-** This study adhered to ethical guidelines established by the Institutional Ethical Committee. Ethical clearance was obtained before initiation, with approval issued under reference number SIMS/IEC/940/2024-25, ensuring compliance with standards for patient privacy, consent, and welfare.

**RESULTS**

During the study duration, data concerning 1631 children of dermatoses presenting to the dermatology outpatient department (OPD) consisting of individuals aged between 5 to 14 years were meticulously analyzed. The average age of the population examined was 10.5±2.8

years. In our study population, about 53.8% were male and 46.2% were female children. The male-to-female ratio was found to be 1.2:1. The highest frequency of children was observed within the age demographic of 11-14 years (Table 1).

**Table 1:** Gender and age distribution of dermatoses in the study population

	5-10 Years (N, %)	11-14 Years (N, %)	Total (N, %)
Male (N, %)	364 (22.3)	514 (31.5)	874 (53.8)
Female (N, %)	344(21.1)	409 (25.1)	753 (46.2)
Total (N, %)	708 (43.4)	923 (56.6)	1631 (100)

Among the total of 1631 children, the predominant category of pediatric dermatosis identified was infestations and infectious disorders, representing 49.11%, followed by eczematous disorders, sebaceous and sweat gland disorders, hypersensitivity disorders, pigmentation disorders, cornification disorders, papulo-squamous disorders, hair and nail disorders, vesiculobullous disorders, and insect bite reactions sequentially.

Notably, pigmentation disorders, as well as hair and nail disorders, were more prevalent among female children compared to male children. The distribution of dermatoses documented in this study is comprehensively detailed and elucidates the various categories of conditions identified in children, as presented in Table 2.

**Table 2:** Distribution of dermatoses in the study population

Dermatoses	Male	Female	N	%
Infections and infestation disorders	479	322	801	49.11
Eczematous disorders	138	140	278	17.04
Disorder of sebaceous and sweat gland	71	58	129	7.91
Hypersensitivity disorders	41	39	80	4.90
Disorders of pigmentation	22	54	76	4.66
Disorders of cornification	29	27	56	3.43
Papulo-squamous and related disorder	23	17	40	2.45
Disorders of hair and nail	11	24	35	2.15
Vesiculo Bullous disorders	11	10	21	1.29
Insect bite reaction	11	9	20	1.23
Other/Miscellaneous	44	51	95	5.82
Total	880	751	1631	100.0

Parasitic infestations emerged as the most significant disorders affecting the study population, followed by fungal, bacterial, and viral infections. Among parasitic infestations, scabies were the most frequently diagnosed condition, accounting for a substantial proportion of cases at 17.84%. In fungal infections, Tinea Corporis was

the most commonly identified, present in 8.34% of the studied patients. In bacterial infections, furuncle was diagnosed in 5.27% of children, while in viral infections, Verruca Vulgaris affected 2.08% of pediatric dermatoses patients within the scope of our study (Table 3).

**Table 3:** Distribution of infections and infestation disorders among the study population

Infections and infestation disorders	5-10 Years		11-14 Years		Total (N)	%
	Male	Female	Male	Female		
Infestation						
Scabies	61	43	133	54	291	17.8
Pediculosis	1	2	0	1	4	0.2
Fungal Infection						
Tinea Corporis	26	21	57	32	136	8.3
Tinea Capitis	4	2	6	2	14	0.9
Tinea Cruris	5	2	18	8	33	2.0
Tinea Faciei	1	2	4	1	8	0.5
Tinea Pedis	0	3	1	1	5	0.3
Tinea Manum	1	1	0	0	2	0.1
Tinea Versicolor	5	6	21	29	61	3.7
Intertrigo	2	0	3	0	5	0.3
Bacterial Infection						
Impetigo Contagiosa	4	7	0	1	12	0.7
Folliculitis	3	3	5	3	14	0.9
Furuncle	24	15	27	20	86	5.3
Acute Paronychia	1	0	1	0	2	0.1
Leprosy	18	17	4	3	42	2.6
Pitted Keratolysis	0	0	1	0	1	0.1
Viral Infection						
Molluscum Contagiosum	6	5	0	2	13	0.8
Verruca Vulgaris	7	6	12	9	34	2.1
Varicella Zoster Infection (chicken pox)	8	4	2	5	19	1.2
Herpes zoster	2	2	0	1	5	0.3
Hand Foot and Mouth Disease	1	3	0	0	4	0.2
Viral Exanthem	2	3	2	3	10	0.6
Total	182	147	297	175	801	49.11

Eczematous disorders constituted the second largest manifestation of pediatric dermatoses within the study population, with 278 children affected, representing 17.04% of the total cases. Pityriasis alba was identified as the most prevalent eczematous disorder, impacting 4.35% of children, succeeded by Nummular eczema,

which affected 2.8% of the pediatric population. It is noteworthy that eczematous disorders were more prominently identified in female children compared to male children and also exhibited a higher prevalence in the 5 to 10-year-old age group within our study (Table 4).

**Table 4:** Distribution of Eczematous disorders among the study population

Eczematous disorders	5-10 Years	11-14 Years	Total (N)		Total (N)	%
	Male	Female	Male	Female		
Allergic Contact Dermatitis	10	10	9	6	35	2.15
Irritant Contact Dermatitis	2	4	3	1	10	0.61
Pityriasis alba	20	23	13	15	71	4.35
Seborrheic Dermatitis	6	3	6	8	23	1.41
Lip Lick Dermatitis	2	1	1	1	5	0.31
Lichen Striatus	3	1	1	1	6	0.37
Lichen Planus	6	3	3	3	15	0.92
Lichen Spinulosus	3	3	2	1	9	0.55
Lichen Nitidus	3	3	2	1	9	0.55
Hand Eczema	5	4	3	5	17	1.04
Nummular Eczema	11	15	8	11	45	2.76
Dry Discoid Eczema	4	4	3	1	12	0.74
Infected Eczema	4	2	5	10	21	1.29
Total	79	76	59	64	278	17.04

In the category of non-infectious/non-eczematous pediatric dermatoses, sebaceous and sweat gland disorders affected 7.9% of the total study population, followed by hypersensitivity, pigmentation, cornification, papulosquamous, hair and nail, Vesiculobullous disorders, and insect bite reactions. Acne vulgaris was the most frequently observed condition within the sebaceous and sweat gland disorders, impacting 5.9% of the study population. In pigmentary disorders, Vitiligo vulgaris was the most commonly observed condition, affecting 3.4% of cases. Among hypersensitivity disorders, Urticaria was the predominant diagnosis,

affecting 3.7% of the total study children. Psoriasis vulgaris was identified as the most common papulosquamous disorder, impacting 1.2% of cases within our study. Among the disorders related to cornification, Xerosis cutis and Keratoderma climatericum were the most prevalent, affecting 1.3% of their respective subgroups. Other noteworthy conditions are delineated in Table 5. Across all dermatological disorders, the male children were more prevalent, except pigmentation, hair and nail disorders and miscellaneous were observed more frequently in female children.

**Table 5:** Distribution of dermatoses other than infective and Eczematous disorders among the study population.

Dermatoses other than infective and Eczematous	5-10 Years		11-14 Years		Total (N)	%
	Male	Female	Male	Female		
Disorder of Sebaceous and Sweat Gland						
Acne Vulgaris	2	6	46	42	96	5.9
Miliaria Rubra	10	6	9	2	27	1.7
Miliaria Crystallina	0	0	2	0	2	0.1
Palmoplantar Hyperhidrosis	0	1	1	0	2	0.1
Sebaceous Hyperplasia	0	0	0	1	1	0.1
Perioritis	0	0	1	0	1	0.1
Disorders of Pigmentation						
Vitiligo Vulgaris	8	22	4	22	56	3.4

Post Inflammatory Hypopigmentation	0	2	0	2	4	0.2
Post Inflammatory Hyperpigmentation	0	0	3	2	5	0.3
Nevus Depigmentosus	3	0	2	1	6	0.4
Periorbital Hypermelanosis	1	0	1	3	5	0.3
Hypersensitivity Disorders						
Papular Urticaria	8	7	0	3	18	1.1
Urticaria	21	18	11	10	60	3.7
Id Reaction (Autosensitization Dermatitis, Autoeczematization)	1	1	0	0	2	0.1
Papulosquamous and Related Disorder						
Psoriasis						
Psoriasis Vulgaris	3	5	6	5	19	1.2
Guttate Psoriasis	0	0	0	3	3	0.2
Palmoplantar Psoriasis	1	0	0	0	1	0.1
Plantar Psoriasis	2	0	1	0	3	0.2
Scalp Psoriasis	0	0	1	1	2	0.1
Pityriasis Rosea	1	2	8	1	12	0.7
Disorders of Cornification						
Xerosis Cutis	4	8	6	4	22	1.3
Palmoplantar kerotoderma	1	0	8	3	12	0.7
Keratoderma Climatericum	3	4	7	7	21	1.3
Ichthyosis Vulgaris	0	0	0	1	1	0.1
Disorders of Hair and Nail						
Alopecia Areata	6	5	1	4	16	1.0
Female Pattern Hair Loss	0	0	0	1	1	0.1
Traction Alopecia	0	1	0	0	1	0.1
Chronic Telogen Effluvium	0	3	2	7	12	0.7
Canities (Premature Graying)	1	1	1	0	3	0.2
Nail Disorder	0	0	0	2	2	0.1
Vesiculo-Bullous Disorders	5	5	6	5	21	1.3
Insect Bite Reaction	4	3	7	6	20	1.2
Other/Miscellaneous	20	20	24	31	95	5.8
Total	105	120	158	169	552	33.8

## DISCUSSION

Paediatric dermatological disorders represent a considerable public health issue within the community. The integumentary system in paediatric patients displays unique attributes in contrast to that of adult individuals, necessitating specialized treatment and thoughtful consideration. The prevalence and presentation of dermatological ailments are influenced by factors, including but not limited to age, sex, seasonal

fluctuations, socio-economic status, immune competence, religious affiliations, and educational achievements.

The distribution of paediatric dermatoses within the Indian demographic provides critical insights regarding age and sex. Research indicates that skin disorders are widespread among children, exhibiting diverse patterns contingent upon demographic variables. In our analysis, the highest incidence of cases was noted in the 11-14

year age group; according to Verma *et al.* [7], the majority of paediatric patients afflicted by dermatoses fall within the 1-5 year age range, constituting 33.20% of cases. Conversely, the study by Jadav *et al.* [8], identifies a substantial proportion (53.1%) of cases occurring in the 5-11 year age group.

In our study, the gender distribution was recorded as 53.8% males and 46.2% females, producing a male-to-female ratio of 1.2:1. According to Gandhi *et al.* [9], males are predominantly impacted, with studies documenting male-to-female ratios approximating 1.48:1; however, in certain conditions, such as specific types of dermatoses, a higher prevalence in females is noted as per the findings from Jadav *et al.* [8]. Paediatric dermatoses primarily affect younger males; nonetheless, specific conditions may demonstrate gender discrepancies, underscoring the necessity for targeted healthcare interventions.

In our study, the predominant category of pediatric dermatoses identified was infectious and infestation disorders, constituting 49.11% of the total cases analyzed. Within this classification, infestations represented 18.09% of the cases, whereas infections accounted for 31.02%. These results corroborate earlier investigations conducted in India, including those by Bonthu *et al.* [10] Podder *et al.* [11] and other studies [12-16]. Comparable trends have also been documented in other nations, such as Nepal (32.12%) [17] Mali (55.10%), and Pakistan (59%) [18,19].

Scabies emerged as the most prevalent infestation within the study, accounting for 17.84% of the cases examined. These findings align with prior studies that identified scabies as the predominant infestation [13,14,16,20]. The elevated occurrence of scabies within our demographic can be attributed to several factors, including its highly contagious nature and the socio-economic challenges faced by the study population. Numerous individuals accessing hospital services originate from rural locales characterized by overcrowding, minimal educational attainment, inadequate hygiene practices, and substandard living conditions, all of which facilitate the transmission of scabies. In light of these findings, it is essential to conduct further investigations into the prevalence of scabies to devise targeted interventions to mitigate this issue effectively.

In our study, we noted that the incidence of fungal infections (16.19%) surpassed that of bacterial infections (9.63%) and viral infections (5.21%). This observation is consistent with the findings of Podder *et al.* [11] and Chitapur *et al.* [20], who similarly noted a greater prevalence of fungal infections.

Tinea corporis (8.34%) was identified as the most prevalent fungal infection in our analysis, consistent with Amin *et al.* [19] and Chitapur *et al.* [20]. However, this finding contrasts with those of Podder *et al.* [11] Ranavio *et al.* [21] and Saini *et al.* [22], who reported other fungal infections as predominant condition. Furuncle (5.27%) was the most frequently observed bacterial infection in our study; nonetheless, these results contradict the findings presented in the research conducted by Saini *et al.* [22] and Medasani *et al.* [23], who identified impetigo as the most common bacterial infection in their respective analyses. This observed variation may be ascribed to the older age group of children in the present study, which could affect the nature of the infections experienced. While impetigo is predominantly documented in children between the ages of 2 to 5 years, older children might possess distinct exposure risks and hygiene behaviors, which could conceivably result in a diminished prevalence of impetigo. In our study, the most prevalent viral infections were Verruca Vulgaris and Varicella Zoster Infection (2.08% and 1.16%). The high incidence of infections and infestations observed in this study may be ascribed to the substantial rural and economically disadvantaged population utilizing hospital services, which heightens the risk of dermatoses in children as a consequence of poor hygiene and overcrowded living conditions.

Eczematous disorders constituted our study's second most prevalent category of disorders, affecting 17.04% of the pediatric population examined. Pityriasis alba (4.35%) and Nummular Eczema (2.76%) were identified as the two most prevalent eczematous disorders. A study from Western India indicated that atopic dermatitis comprised 30.1% of cases, with seborrheic dermatitis at 21.5% and pityriasis alba at 15.5% [24]. Additionally, another study from South India reported that eczematous diseases contributed to 32.7% of pediatric dermatoses, with atopic dermatitis being the most frequently encountered at 10% [3].

Sebaceous and sweat gland disorders represented 7.9% of the total pediatric dermatoses in our study,



comparable to Chitapur *et al.* [20] and Mavoori's *et al.* [25] findings. Acne Vulgaris emerged as the predominant disorder within the spectrum of sebaceous and sweat gland conditions, impacting approximately 5.9% of cases, consistent with the outcomes reported in the study by Chitapur *et al.* [20]. In a parallel context, Vitiligo Vulgaris was identified as the most prevalent pigmentary disorder, affecting 3.4% of cases, a result that corroborates findings from another study *et al.* [10]. Hypersensitivity disorders accounted for 4.9% of the overall pediatric dermatoses. Urticaria was recognized as the most frequent disorder, constituting 4.8% of all dermatoses. In a study conducted by Pathak, papular urticaria represented 3.6% of all cases [15]. The papulosquamous disorder influenced 2.5% of the pediatric dermatoses in our research, with Psoriasis Vulgaris representing 1.2% of all dermatosis cases; however, the prevalence of papulosquamous disorders was observed to be higher in studies conducted by Bonthu *et al.* [10] and Sacchidanand *et al.* [12].

Our present study observed that 3.4% of cases exhibited cornification disorders, with Xerosis cutis (1.3%) identified as the most prevalent disorder in this classification. This observation diverges from the findings of Chitapur, who designated palmoplantar keratoderma as the most frequent condition [20]. Alopecia areata (1%) was our study's most prevalent hair disorder, aligning with conclusions drawn from prior studies [10,12,22].

Overall, this study offers significant insights into the epidemiology of pediatric dermatoses, underscoring the necessity for early identification, suitable management, and focused interventions. These findings can potentially inform healthcare policies and practices, ultimately enhancing patient outcomes and improving the quality of life for pediatric patients experiencing dermatological conditions.

## CONCLUSIONS

The study conducted in the Malnad region of Karnataka revealed that skin diseases, particularly those arising from infections and infestations are prevalent among children. The predominant categories of skin disorders identified included infestations and infections, eczematous disorders, and papulosquamous disorders. The elevated incidence of skin diseases in this region may be attributed to the humid climate and socio-economic challenges. Fungal infections were more

prevalent among older children and teenagers, potentially linked to inadequate hygiene practices.

Proactive detection and timely management could mitigate the burden of disease. This study establishes a foundation for developing public health strategies and monitoring shifts in the prevalence of pediatric dermatoses over time. Consequently, there exists an urgent requirement for a comprehensive childhood disease management program to address the critical health issue of skin diseases affecting children in developing nations.

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