

**ORIGINAL RESEARCH**

# Pattern of dermatoses among preschool children in a tertiary care teaching hospital of North India

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## ABSTRACT

**Background:** Dermatoses, also known as skin disorders, are commonly seen in pediatric patients. Studies have reported varying rates of skin disorders among children, ranging from 9-37%, with research in India indicating a prevalence of 8.7-35% among children below 18 years old. Although paediatric skin illnesses are very common, there aren't many studies on the subject worldwide, which makes planning health measures challenging. The aim of this study is to investigate the pattern of dermatoses in the pediatric age group and their clinical presentation. **Methods:** This cross-sectional study was conducted in the dermatology OPD of a teaching hospital over a period of twelve months and included preschool children between the ages of one to five years who attended or were referred to the dermatology clinic (OPD/IPD) for evaluation and treatment of skin disorders. Data was collected using a standardized data collection form that was completed by the attending dermatologist. The data was analyzed using descriptive statistics. Frequencies and percentages were used to describe the prevalence of different dermatoses in the study population. **Results:** The study found that dermatoses in preschool children were common, with infections and infestations being the most frequent (45.9%), followed by eczema (22.0%) and hypersensitivity (14.3%). Bacterial infections were the most common type of infection (41.9%), while among eczema types, atopic dermatitis was the most prevalent (8.6%). Parasitic infections were also found to be common (22.4%). Physiological and transient non-infective neonatal dermatoses were reported in 3.6% of cases. The study highlights the need for early detection and management of dermatoses in preschool children to prevent complications and improve quality of life. **Conclusion:** The present study identified infections and infestations as the most common group of dermatoses in preschool children, with bacterial infections being the most common type of infection. These findings emphasize the need for appropriate prevention and management strategies for these conditions in preschool children.

**Keywords:** Dermatoses, preschool children, eczema, bacterial, fungal, allergic

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## INTRODUCTION

Dermatoses, also known as skin disorders, are commonly seen in pediatric patients. Skin disorders can range from mild conditions, such as eczema and diaper rash, to more severe diseases, such as psoriasis and genetic skin disorders. These disorders can be a source of discomfort for the child, and can also have a significant impact on the quality of life of both the child and their family.[1,2]

Preschool children are particularly vulnerable to dermatoses due to their delicate skin and increased exposure to irritants and allergens. Despite the prevalence of these conditions, limited studies have been conducted on the patterns of dermatoses in preschool children. Understanding the patterns of dermatoses in this age group is essential for providing effective management and treatment options.[3,4]

The clinical presentation, medical management, and disease progression of paediatric dermatoses are significantly different from those of adult dermatoses. Compared to adults, children's dermatoses are more affected by socioeconomic level, regional eating patterns, and climatic factors. Infections with bacteria, fungi, and viruses are frequent among school-age children. Studies have reported varying rates of skin disorders among children, ranging from 9-37%, with research in India indicating a prevalence of 8.7-35% among children below 18 years old. Although paediatric skin illnesses are very common, there aren't many studies on the subject worldwide, which makes planning health measures challenging.[5,6,7]

The aim of this study is to investigate the pattern of dermatoses in the pediatric age group and their clinical presentation. This research will provide insights into

the most common skin diseases among children and their characteristics, which can aid in early diagnosis and treatment. Additionally, it will contribute to the knowledge base on pediatric dermatology, which is essential for improving the quality of care for children with skin disorders.

**MATERIALS AND METHODS**

This cross-sectional study was conducted in the dermatology OPD of a teaching hospital over a period of twelve months (June 2021 to May 2022). The study protocol was approved by the hospital's ethical review committee. The study included preschool children between the ages of one to five years who attended or were referred to the dermatology clinic (OPD/IPD) for evaluation and treatment of skin disorders. Children with underlying medical conditions or immunosuppression were excluded from the study. Informed consent was obtained from the parents or legal guardians of all study participants. The confidentiality and privacy of the participants was maintained throughout the study.

Data was collected using a standardized data collection form that was completed by the attending dermatologist. The form included information on demographics, medical history, and clinical presentation of the skin disorder. A thorough general, cutaneous and systemic examination was done and arrived at definitive clinical diagnosis. Relevant

investigations like KOH mount, Wood's lamp examination, diascopy, gram's stain, Tzanck test, haematological and biochemistry analysis and skin biopsy as needed were done where indicated.

The data was analyzed using descriptive statistics. Frequencies and percentages were used to describe the prevalence of different dermatoses in the study population.

**RESULTS**

The study found that infections and infestations were the most common dermatoses among preschool children, accounting for 45.9% of cases. Of these, bacterial infections were the most prevalent, accounting for 41.9%, followed by parasitic infections at 22.4%. Fungal infections accounted for 19.1% and viral infections accounted for 14.8% of cases. Eczema was the second most common dermatoses, with 9 types identified and accounting for 22.0% of cases. Hypersensitivity disorders were present in 14.3% of cases, with papulosquamous and pigmentary disorders each accounting for 3.8% of cases. Naevi accounted for 4.6% of cases, while sweat gland and hair disorders were less common, accounting for 3.0% and 0.6% of cases, respectively. Physiological and transient noninfective neonatal dermatoses accounted for 3.6% of cases, and there were 35 cases (3.0%) classified as "others" that did not fit into any of the above categories (Table 1).

**Table 1: Pattern of Dermatoses among preschool children.**

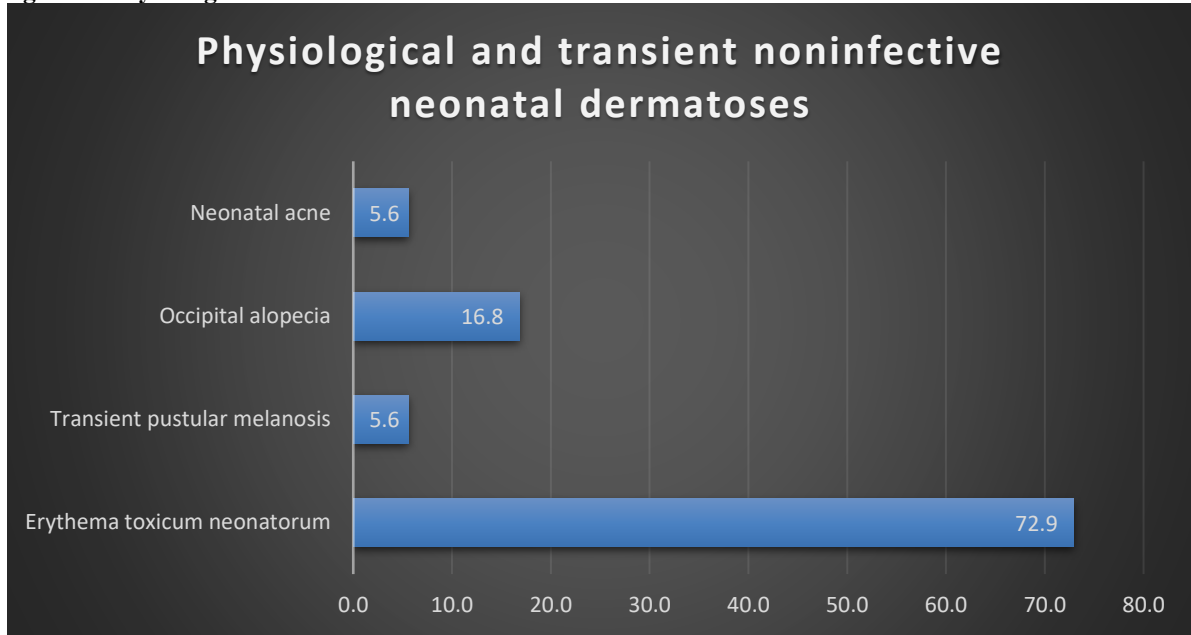
Pattern of Dermatoses	Frequency	%
<b>PTIND</b>	41	3.6
<b>Eczema (9 types)</b>	255	22.0
<b>Infections and infestations</b>	534	45.9
Bacterial	228	41.9
Viral	81	14.8
Fungal	104	19.1
Parasitic	122	22.4
<b>Hypersensitivity</b>	166	14.3
<b>Naevi</b>	53	4.6
<b>Papulosquamous</b>	44	3.8
<b>Pigmentary</b>	44	3.8
<b>Hair</b>	7	0.6
<b>Sweat glands</b>	35	3.0
<b>Others</b>	35	3.0

\*Physiological and transient noninfective neonatal dermatoses

The Figure 1. shows the prevalence percentage of physiological and transient noninfective neonatal dermatoses. Erythema toxicum neonatorum has the highest prevalence at 72.9%, followed by occipital alopecia at 16.8%. Transient pustular melanosis and neonatal acne have a lower prevalence of 5.6% each.

These dermatoses are typically benign and self-resolving, and do not require any specific treatment. However, it is important for healthcare providers to be aware of these conditions and be able to differentiate them from more serious skin conditions that may require intervention.

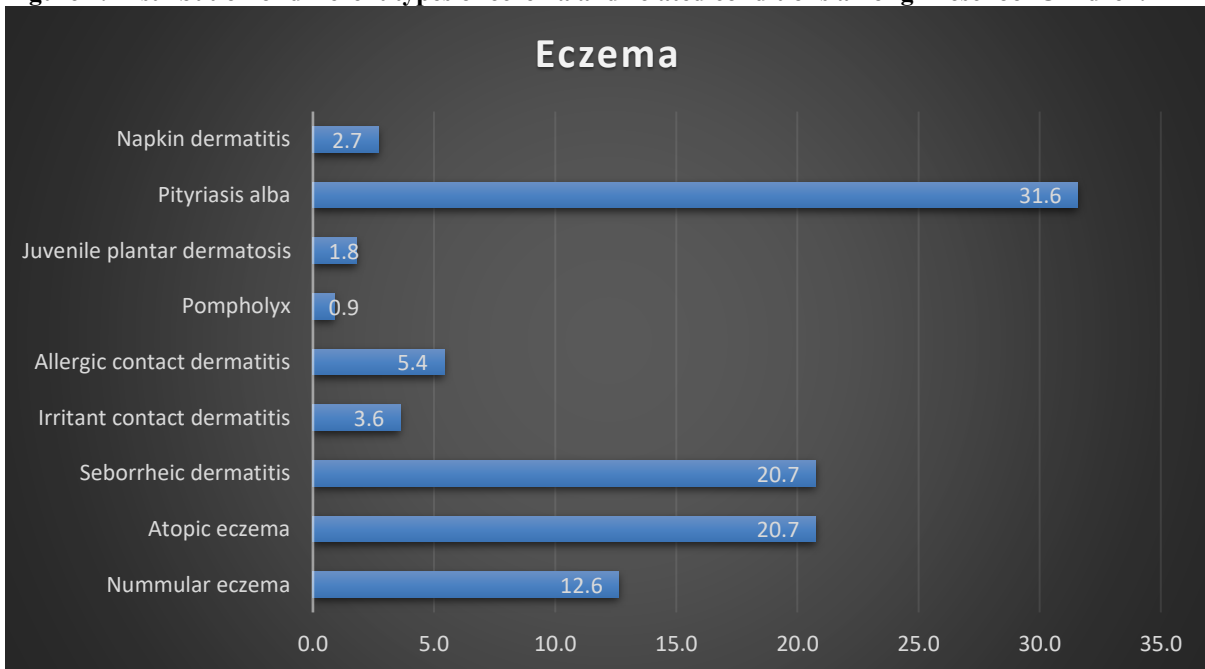
**Figure 1. Physiological and transient noninfective neonatal dermatoses.**



The Figure 2. lists various types of eczema along with their percentage prevalence. Nummular eczema has a prevalence of 12.6%, while atopic eczema and seborrheic dermatitis are the most common types with a prevalence of 20.7% each. Irritant contact dermatitis has a prevalence of 3.6% and allergic contact dermatitis has a prevalence of 5.4%. Pompholyx and

juvenile plantar dermatosis have a lower prevalence of 0.9% and 1.8%, respectively. Pityriasis alba, a type of eczema that mostly affects children, has a higher prevalence of 31.6%. Finally, napkin dermatitis, which affects infants and is caused by contact with irritants like urine and feces, has a prevalence of 2.7%.

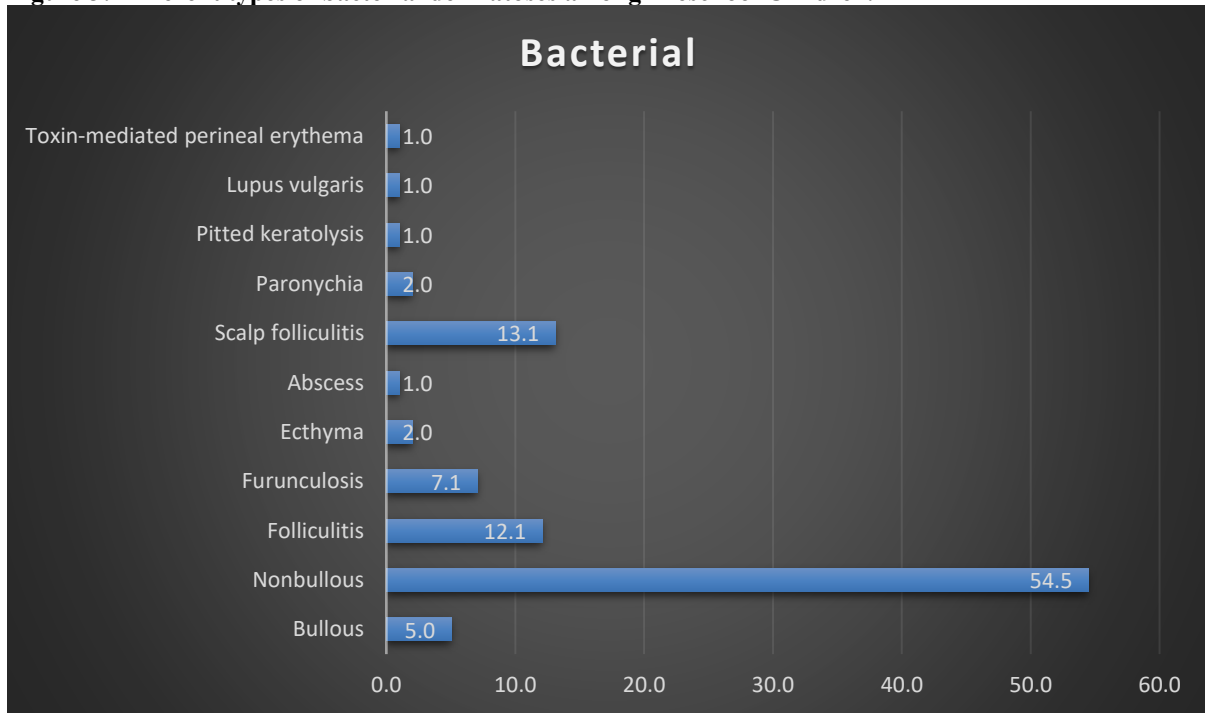
**Figure 2. Distribution of different types of eczema and related conditions among Preschool Children.**



Bacterial skin infections can be categorized into various types based on the clinical presentation. The Figure 3. provided lists the different types of bacterial skin infections and their corresponding percentage prevalence in the population. The nonbullous type of bacterial skin infection is the most common, accounting for 54.5% of cases, while bullous

infections account for only 5.0% of cases. Other types of bacterial infections listed in the table include folliculitis, furunculosis, ecthyma, abscess, scalp folliculitis, paronychia, pitted keratolysis, lupus vulgaris, and toxin-mediated perineal erythema, each with varying prevalence rates.

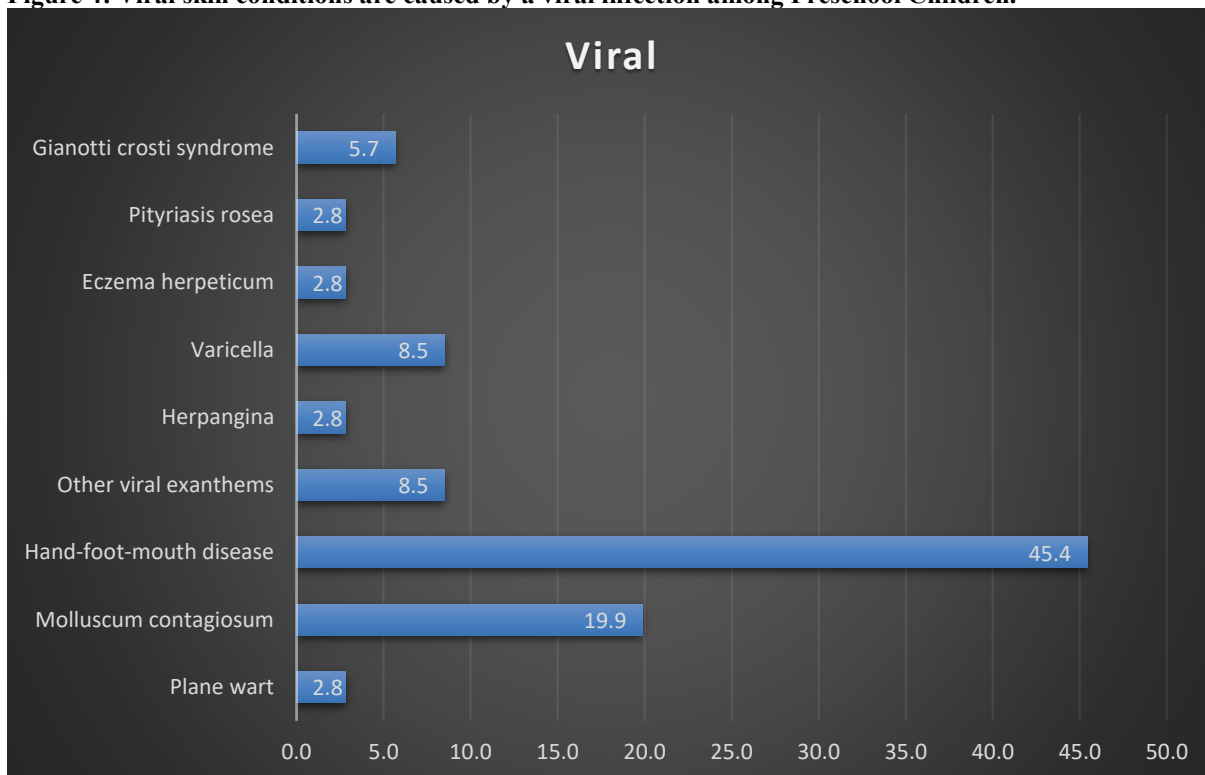
**Figure 3: Different types of bacterial dermatoses among Preschool Children.**



The Figure 4. represents viral skin infections and their prevalence. Hand-foot-mouth disease is the most prevalent viral skin infection with a prevalence rate of 45.4%. Molluscum contagiosum is the second most common viral skin infection with a prevalence rate of 19.9%, followed by other viral exanthems with a

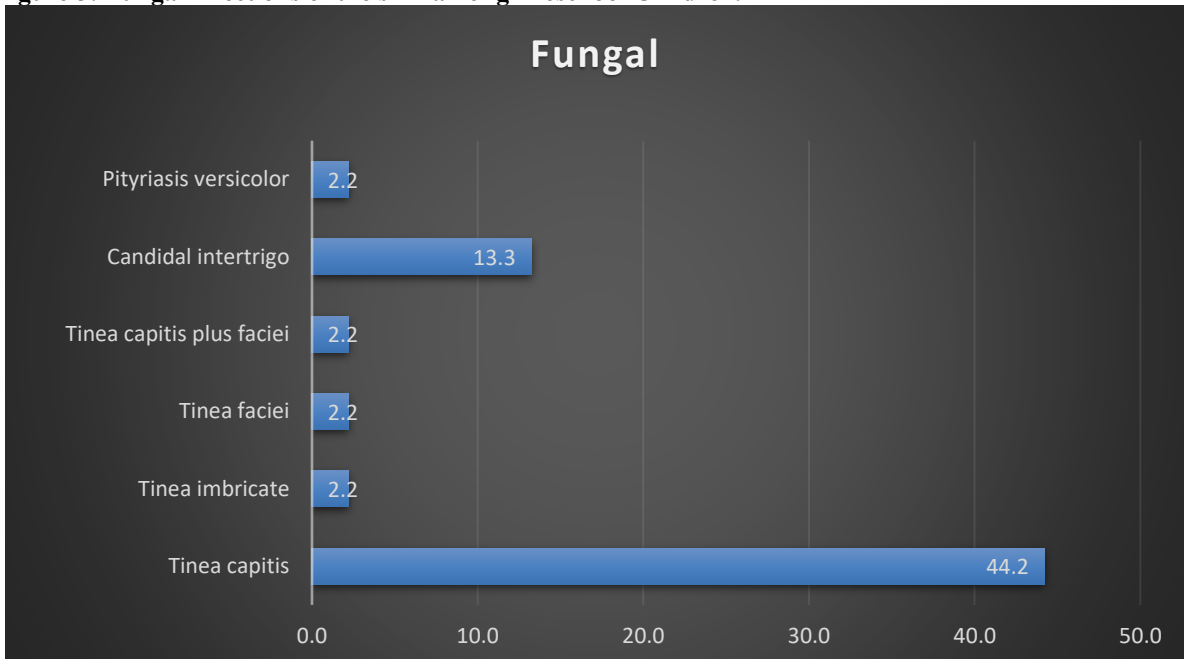
prevalence rate of 8.5%. Varicella has a prevalence rate of 8.5% and Gianotti crosti syndrome has a prevalence rate of 5.7%. Herpangina and plane warts each have a prevalence rate of 2.8%, while eczema herpeticum and pityriasis rosea each have a prevalence rate of 2.8%.

**Figure 4: Viral skin conditions are caused by a viral infection among Preschool Children.**



Fungal infections of the skin include tinea capitis, which accounts for 44.2% of cases, tinea imbricate (2.2%), tinea faciei (2.2%), and tinea capitis plus faciei (2.2%). Candidal intertrigo accounts for 13.3% of cases, while pityriasis versicolor accounts for 2.2% (Figure 5).

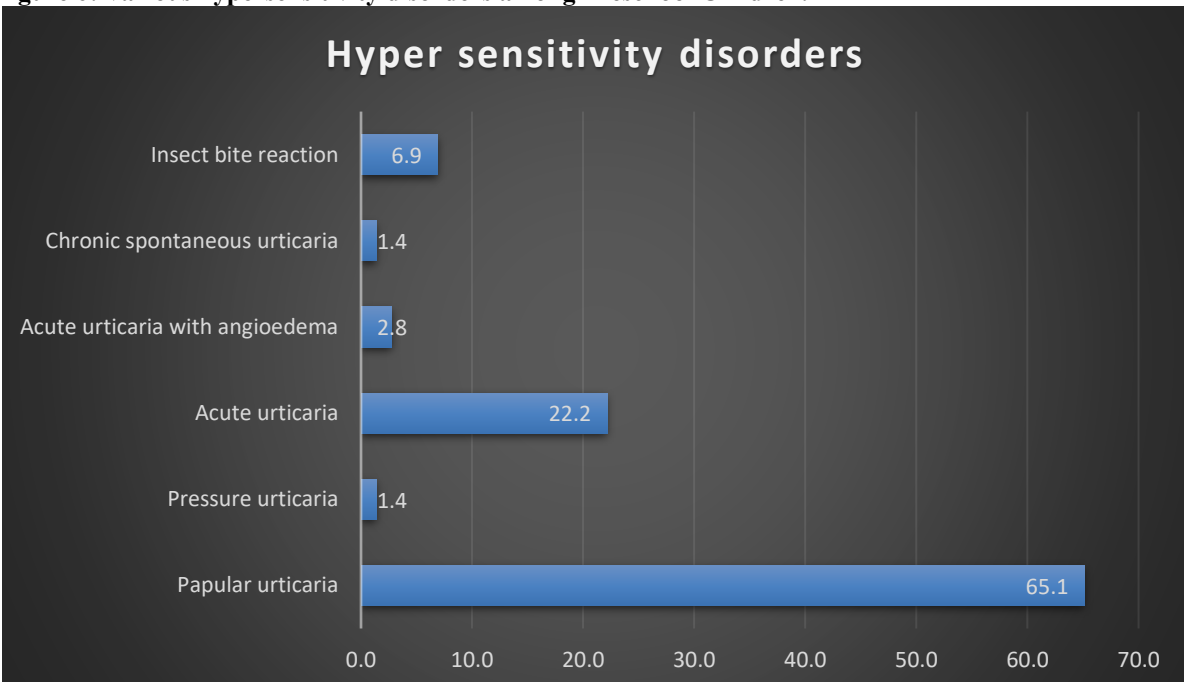
**Figure 5: Fungal infections of the skin among Preschool Children.**



Hyper sensitivity disorders refer to the conditions that occur due to an abnormal immune response to an allergen or stimulus. Papular urticaria, with a prevalence of 65.1%, is a common hypersensitivity disorder. Acute urticaria, acute urticaria with angioedema, and chronic spontaneous urticaria are

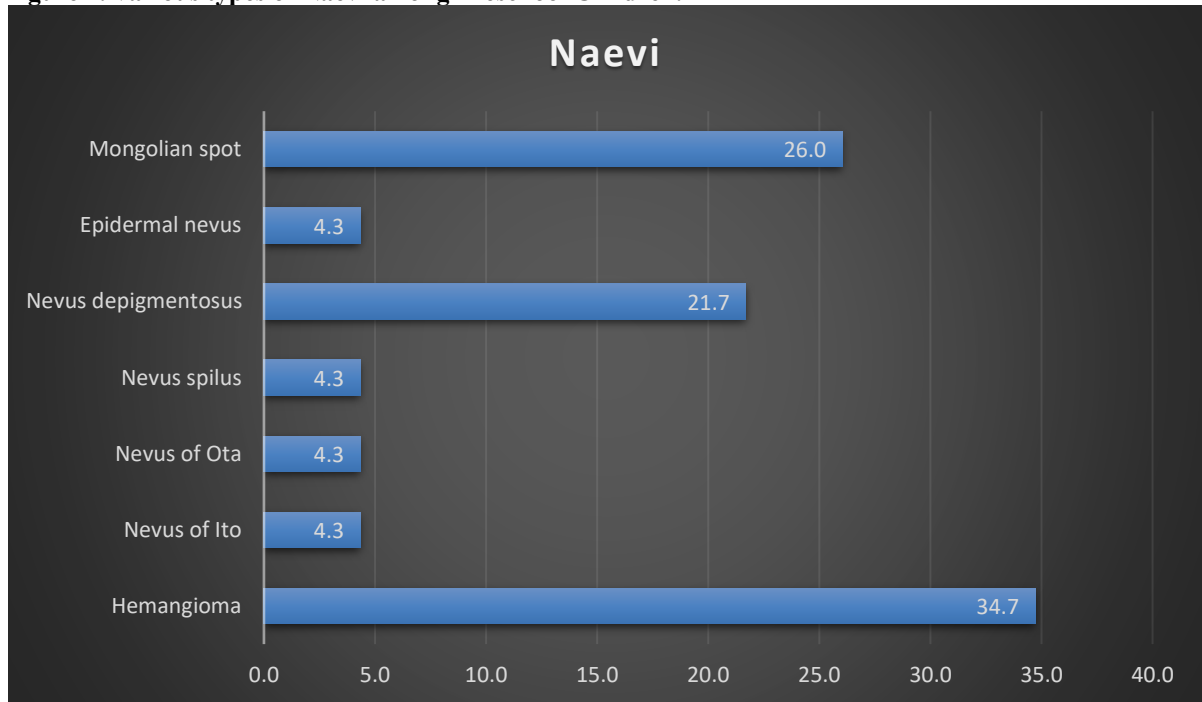
other types of urticaria with prevalence rates of 22.2%, 2.8%, and 1.4%, respectively. Insect bite reaction and pressure urticaria are other hypersensitivity disorders that have prevalence rates of 6.9% and 1.4%, respectively (Figure 6).

**Figure 6: Various hypersensitivity disorders among Preschool Children.**



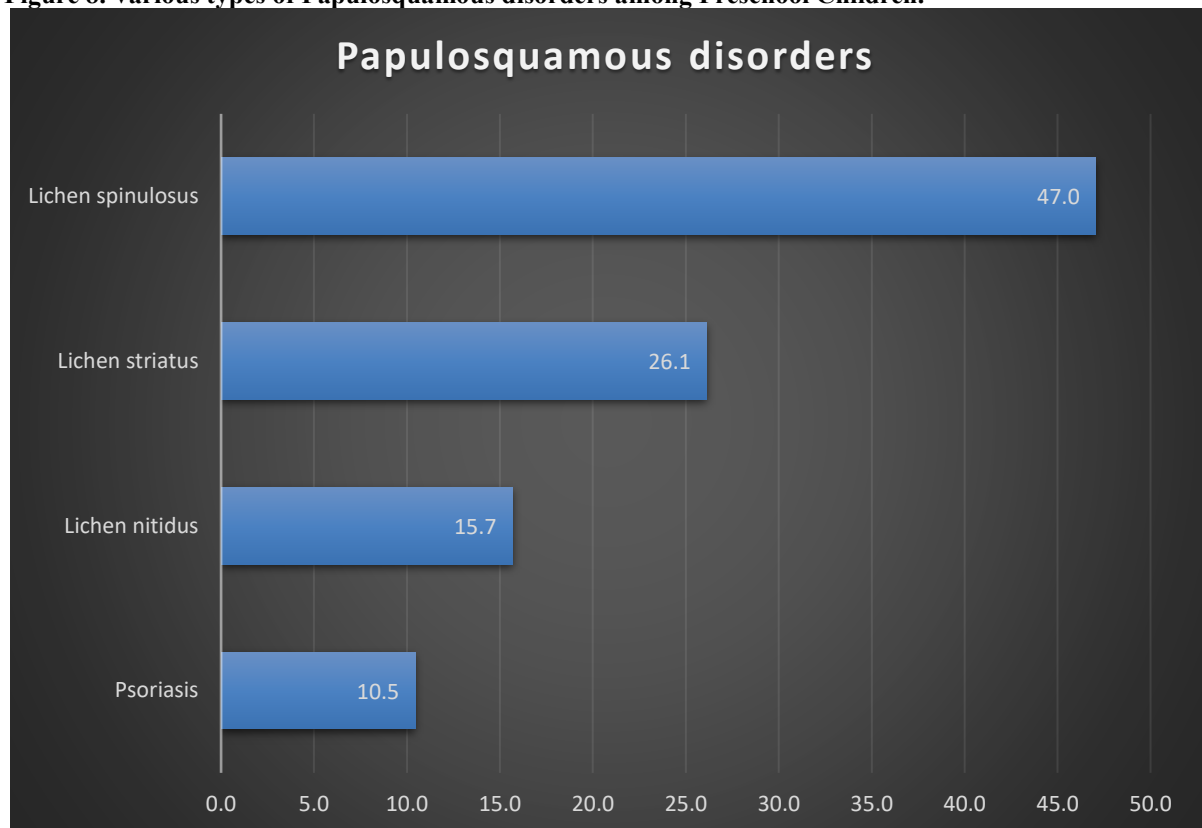
In the Figure 6, there is a list of Naevi and their respective percentages. The first one is Hemangioma, which accounts for 34.7%. Nevus of Ito, Nevus of Ota, and Nevus spilus are all 4.3% each. Nevus depigmentosus has a percentage of 21.7%, and Epidermal nevus accounts for 4.3%. Finally, the Mongolian spot has the highest percentage with 26.0%.

**Figure 7. Various types of Naevi among Preschool Children.**



Papulosquamous disorders refer to a group of skin conditions that are characterized by raised, scaly papules or plaques on the skin. In the Figure 8. Psoriasis accounts for 10.5% of cases, Lichen nitidus accounts for 15.7%, Lichen striatus accounts for 26.1%, and Lichen spinulosus accounts for 47.0%.

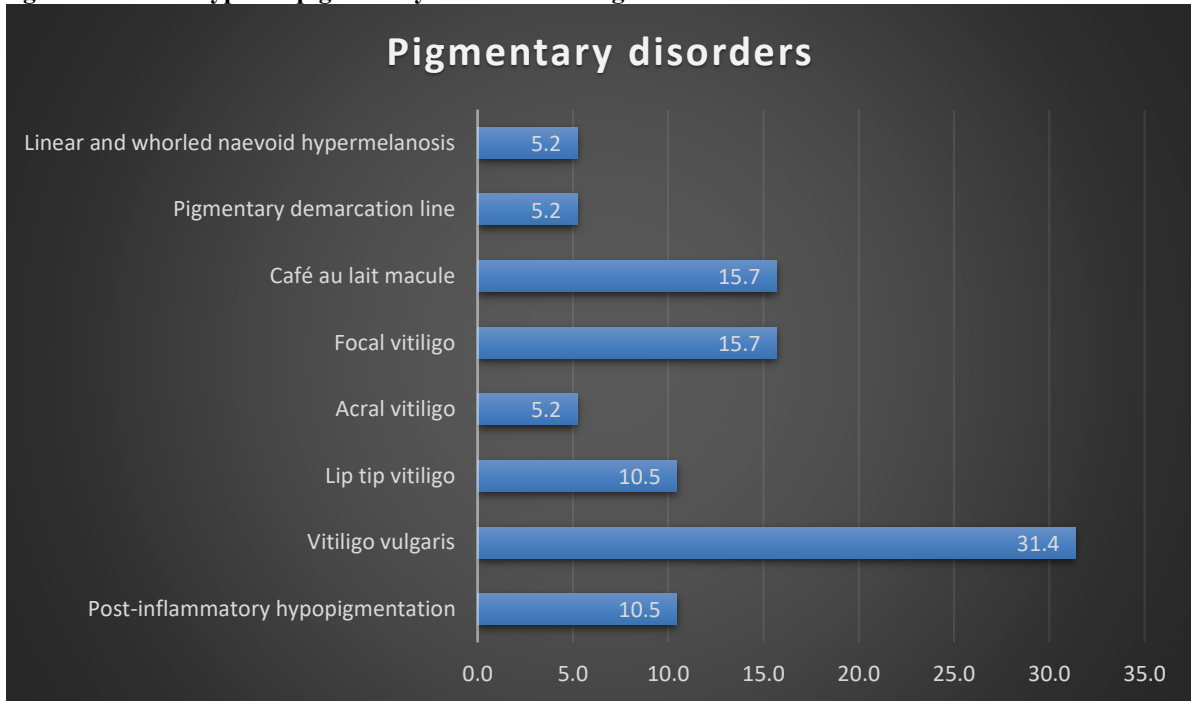
**Figure 8. Various types of Papulosquamous disorders among Preschool Children.**



The Figure 9. lists various pigmentary disorders and their respective percentages. Post-inflammatory hypopigmentation is at 10.5%, Vitiligo vulgaris is at 31.4%, Lip tip vitiligo is at 10.5%, Acral vitiligo is at 5.2%,

Focal vitiligo is at 15.7%, Café au lait macule is at 15.7%, Pigmentary demarcation line is at 5.2%, and Linear and whorled naevoid hypermelanosis is at 5.2%.

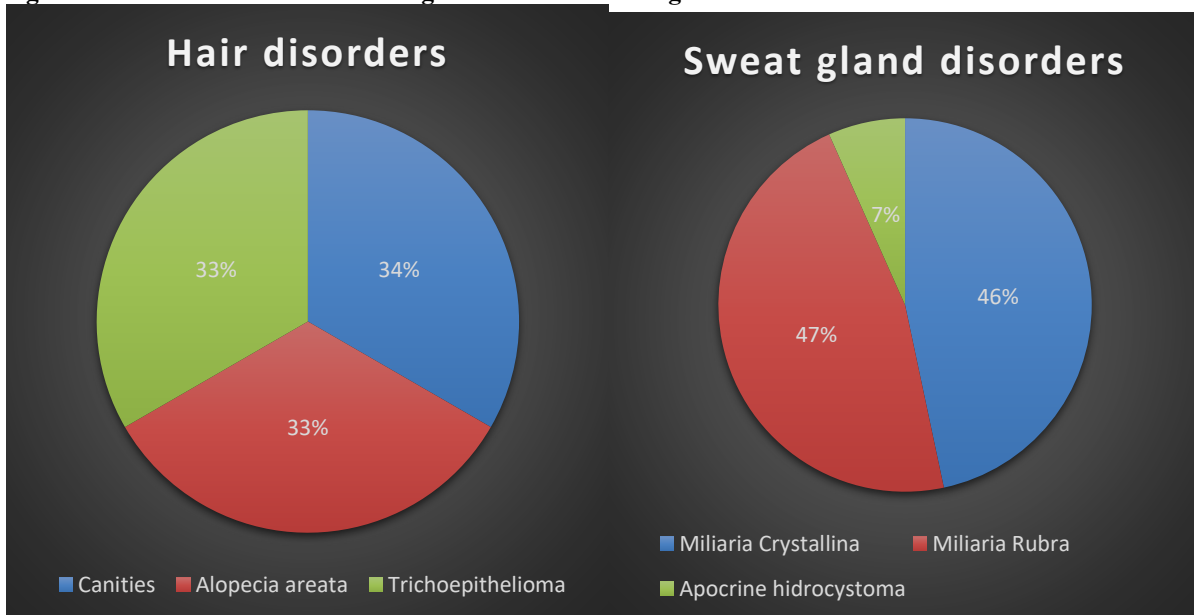
**Figure 9. Various types of pigmentary disorders among Preschool Children.**



The Figure 10. lists common hair and sweat gland disorders. Canities, alopecia areata, and trichoepithelioma are all hair disorders, with each having a prevalence of 32.9%. Canities refers to premature graying of hair, while alopecia areata is an autoimmune disorder that causes hair loss, and trichoepithelioma is a type of benign tumor that forms from hair follicles. On the other hand, miliaria crystallina and miliaria rubra are both types of sweat

gland disorders, with a prevalence of 46.0% each. Miliaria crystallina is a superficial form of sweat retention that occurs in newborns and infants, while miliaria rubra is a more severe form of sweat retention that causes itching and discomfort. Finally, apocrine hidrocystoma is another type of sweat gland disorder that has a prevalence of 6.6%. It is a cystic lesion that forms from the sweat glands in the apocrine region, such as the axilla or groin.

**Figure 10. Hair disorders and Sweat gland disorders among Preschool Children.**



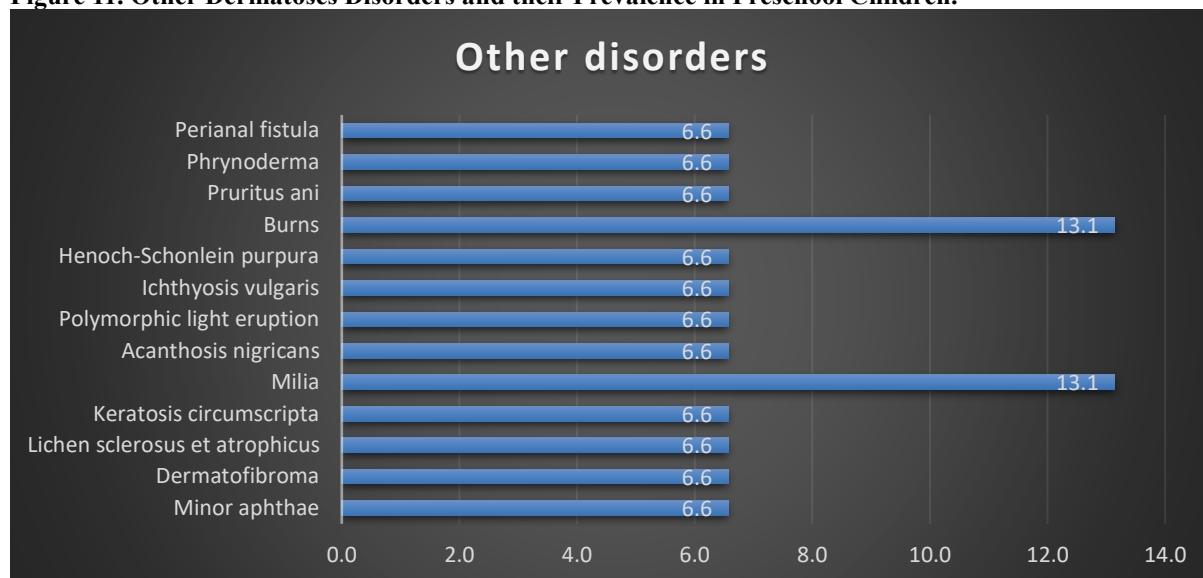
The Figure 11. shows the prevalence of other dermatological disorders observed in preschool

children. The prevalence of each disorder is expressed as a percentage of the total number of other

dermatological disorders. Milia and burns were the most prevalent disorders observed, with a prevalence of 13.1%. Minor aphthae, dermatofibroma, lichen sclerosus et atrophicus, keratosis circumscripta,

acanthosis nigricans, polymorphic light eruption, ichthyosis vulgaris, Henoch-Schonlein purpura, pruritus ani, phrynoderma, and perianal fistula were less common, each having a prevalence of 6.6%.

**Figure 11. Other Dermatoses Disorders and their Prevalence in Preschool Children.**



**DISCUSSION**

The present study aimed to determine the pattern of dermatoses in preschool children. The findings revealed that infections and infestations were the most common group of dermatoses with a frequency of 45.9% (534 cases), followed by eczema with a frequency of 22.0% (255 cases). These findings are consistent with several previous studies by Hayden et al., Wenk et al., Sayal et al., Sardana et al., Singhal et al., Hon et al., and Javed et al., which reported that infectious dermatoses were the most common dermatological problem in children under the age of 5. [2,3,4,6,8,9,10] However other studies by Devi et al., Patel et al., Porter et al., and Nanda et al., showed that eczematous dermatoses were the most common dermatosis among preschool children. [11,12,13,14]

Among infections and infestations, bacterial infections were the most common with a frequency of 41.9% (228 cases). This is in line with the findings of a study by Gupta et al., which reported bacterial infections as the most common dermatoses in preschool children aged. Additionally, viral infections were found in 14.8% (81 cases) of the study participants, while fungal infections accounted for 19.1% (104 cases) and parasitic infections for 22.4% (122 cases). Similar pattern has been observed in other studies by Karthikeyan et al., Hayden et al., Sardana et al., Negi et al., Sharma et al., and Gupta et al.[1,2,6,15,16,17] Sayal et al., reported fungal infections to be more common while other studies by Wenk et al., and Gul et al., observed viral infections to be the most common.[3,4,18] A study conducted by Abdelmaksoud et al., which reported a high prevalence of parasitic infections among preschool children.[19]

In our study, the nonbullous type of bacterial skin infection is the most common, accounting for 54.5% of cases. However according to Dagan et al., impetigo was the most common childhood skin infection and study by Karthikeyan et al., showed secondary pyoderma was common, followed by impetigo.[1,20]

In our study, the Hand-foot-mouth disease is the most prevalent viral skin infection with a prevalence rate of 45.4%. Molluscum contagiosum is the second most common viral skin infection with a prevalence rate of 19.9%, followed by other viral exanthems with a prevalence rate of 8.5%. Similar pattern has been observed in other studies by Karthikeyan et al., Sayal et al., and Sardana et al., as well.[1,4,6] Additionally in study by Wenk et al., almost equal patients of verrucae and molluscum were seen.[3]

In our study, the prevalence of parasitic infections was 22.4%. Almost similar occurrence (10.61%) has been reported by Sardana et al., and Mitra et al., (16.07%).[6,21] However, lower prevalence of scabies was seen in studies by Wenk et al., Nanda et al., Findlay et al., from the West.[3,14,22]

Hypersensitivity dermatoses were observed in 14.3% (166 cases) of the study participants, with papular urticaria being the most common condition. This is consistent with the findings of a study by Karthikeyan et al., Sardana et al., Hon et al., Negi et al., and Mirshams-Shahshahani et al., which reported that papular urticaria was the most common hypersensitivity dermatosis among preschool children.[1,6,9,15,23]

Naevi, papulosquamous, pigmentary, hair, and sweat gland disorders were less commonly observed, with frequencies ranging from 0.6% to 4.6%. These findings are consistent with those reported in previous



studies by Devi et al., Nanda et al., Sharma et al., Findlay et al., Brenner et al., and Kumar et al. [11,14,16,22,24,25]

### LIMITATIONS

The study is limited by its cross-sectional design, which does not allow for the establishment of causality. Additionally, the study is conducted in a single teaching hospital, which may limit the generalizability of the findings to other populations.

### CONCLUSION

The present study identified infections and infestations as the most common group of dermatoses in preschool children, with bacterial infections being the most common type of infection. Eczema was the second most common dermatosis observed in this population. These findings emphasize the need for appropriate prevention and management strategies for these conditions in preschool children.

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