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#### **A school survey of dermatological disorders and associated socio-economic factors in Lucknow; a region of north India**

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#### **Abstract**

##### ***Background:***

The prevalence of skin disorders amongst children in various parts of India has ranged from 4.3% to 49.1% in school based surveys.

##### ***Aim:***

We undertook this study to determine the prevalence of skin disorders and associated socioeconomic factors amongst school children of Lucknow.

##### ***Method:***

This prospective cross sectional study was conducted in 4 (2 government and 2 private) schools of Lucknow. The students of classes 1 to 5 were examined to search for diseases of the skin and its appendages. The data was tabulated and analyzed using chi square test to study the association between various factors. Level of significance was estimated with 95% confidence intervals and P value.

##### ***Result:***

The overall prevalence of skin disorders was 42.3%. Of them 32.9% students had only one skin disorder while 11.3% students had at least one transmissible skin disorder. The commonest skin disorder was Pityriasis

Alba with an overall prevalence of 14.3%. Pediculosis capitis was the commonest transmissible skin disorder with an overall prevalence of 6.5%. There was statistically significant difference in the prevalence of skin disorders especially infections and infestations in students from different socio-economic classes.

### ***Conclusion:***

The overall prevalence of skin diseases, especially transmissible increased significantly with the decreased socio-economic status.

**Keywords:** dermatological school survey, socio-economic factors, prevalence, school children

**Key message:** Such dermatological surveys are required to estimate the burden of skin disorders and formulate appropriate strategies to prevent and treat them. This will help in reducing the prevalence of skin disorders in children and society.

## **Introduction**

Skin disorders affect 20-30% of the general population at any one time [1]. The prevalence of skin disorders amongst children in various parts of India has ranged from 4.3% to 49.1% in school based surveys [2], [3], [4], [5], [6], [7], [8]. School surveys are useful indicators of the prevalence of various skin disorders and the status of health and hygiene of the society. A survey of school children for skin disorders provides information regarding the epidemiology of diseases like pyodermas, leprosy, infestations and acne vulgaris that are particularly common in that age group. It also results in the early detection of disorders like leprosy. There have been few such reports in our country, particularly by dermatologists [2], [3], [4], [5], [6], [7], [8].

We undertook this study to determine the prevalence of skin disorders and the associated socioeconomic factors amongst primary school children of Lucknow.

## **Aim and Objectives**

1. To determine the prevalence of skin disorders amongst primary school children belonging to different socio-economic strata.
2. To study the epidemiology of different skin disorders common in this age group.
3. To find out the socioeconomic factors affecting the prevalence and pattern of skin disorder.

## Methods

This was a prospective cross sectional study conducted in four schools (two government schools and two private schools) of Lucknow, a northern region of India. The study was approved by the ethical committee of our institution. Informed consent from the Principals of the schools and parents was obtained prior to proceeding with the survey. The study period extended from April 2011 to November 2011. The study population included all the students of classes 1 to 5, aging between 5 to 14 years from the four schools.

An easy to answer semi- structured, carry home questionnaire designed by the researchers was used to collect the data. The data regarding socio-demographic information such as age, sex, residence (urban or rural), number of household members, number of rooms, pet animal exposure, family history of skin diseases, educational status of parents, occupation of the parents and total family income per month were included in the questionnaire. The questionnaire was distributed to the pupils to be filled by their parents at home. For parents who were unable to fill the form, the same was filled by the researchers with the help information obtained from the student and the school authorities.

Each child was examined by the Dermatologist in bright ambient light to search for diseases of the skin and its appendages. The findings were recorded in the same form and photographs were taken after obtaining the consent.

The data gathered using the questionnaire and clinical examination was compiled, coded and entered in Excel spreadsheets. It was tabulated and analyzed using chi square test to study the association between various factors. Level of significance was estimated with 95% confidence intervals and P value.

## Results

A total of 1448 students were included in the study; 58.8% subjects belonged to the under seven age group and 41.2% belonged to the above seven age group. Of them 42.3% students were girls and 57.7% students were boys. About 51.8% of the students belonged to upper or upper middle class according to modified Kuppaswamy classification using consumer price index for the year 2010.

The overall prevalence of skin disorder was 42.3%; 32.9% students had only one skin disorder while the rest had two or more. At least one transmissible skin disorder was detected in 11.3% of the students. The commonest skin disorder was Pityriasis Alba (**fig 5**) with an overall prevalence of 14.3%. Regarding transmissible skin disease, Pediculosis Capitis (**fig 1**) was the commonest with an overall prevalence of 6.5%. Phrynoderma (**fig 2**), Scabies (**fig 3**), Pityriasis Versicolor (**fig 4**), Acne

vulgaris, Bacterial infections, Naevi, hyperhidrosis, Milia, Warts and contact dermatitis were a few other commonly seen dermatoses.



**Fig 1:** Pediculosis capitis.



**Fig 2:** Phrynoderma.



**Fig 3:** Scabies.



**Fig 4:** Pityriasis versicolor.



**Fig 5:** Pityriasis Alba.

### **Socio-demographic determinants of skin disease**

#### ***Age:***

Prevalence of skin disorders was 43.0% in the under seven age group and 41.8% in the above seven years age group. There was statistically insignificant difference in the prevalence of skin disease between the two age groups signifying that there was no association between skin disease and age. However the prevalence of transmissible skin disorders was 9.0% in children aged less than seven years and 14.8% in children above seven years old. This difference was statistically significant implying an association between age and transmissible skin disease.

#### ***Gender:***

Skin disorders were slightly less prevalent in girls when compared to boys (40.5% and 43.5% respectively). This difference was statistically not significant. Infections and infestations were more prevalent in girls when compared to boys (17.0% and 7.2% respectively) and the difference was statistically significant. This implies a significant association between gender and prevalence of transmissible skin disease.

#### ***Educational status of parents:***

The prevalence of skin disorders in children varied with educational status of parents. However there was no particular trend of increase or decrease in the prevalence in relation to educational status of parents. The prevalence was highest (60%) in the group where parents had just completed their higher secondary education (10 +2).

The prevalence of transmissible disease however decreased significantly with an increase in the educational status of the parents. The difference was statistically significant with a prevalence of 26.3% in the

group with lowest and 1.6% in the group with highest educational status of parents. Thus there exists an association between transmissible skin disease and the educational status of parents.

#### ***Income of parents:***

The prevalence of skin disorders among students belonging to different income group was significantly different. The association was statistically significant but failed to show any specific trend of increase or decrease with increase or decrease in income of the family.

The prevalence of transmissible disease was highest (22.2%) in the low income group and lowest (3.8%) in the high income group. There was an association between the family income and transmissible skin disease and prevalence increased with decrease in the family income.

#### ***Socio economic class:***

There was statistically significant difference in the prevalence of skin disorders in students of different socio economic classes. The trend was nonspecific with both the highest (50.6%) and lowest (25.0%) prevalence in the lower socioeconomic classes (upper lower and lower respectively).

Regarding transmissible diseases, the prevalence increased classically with decrease in the socio economic status. The prevalence was highest (22.9%) in the students of lower classes and lowest (0%) in the students of upper classes. The association between socio-economic class and transmissible skin disease was statistically significant.

## **Discussion**

Skin disorders affect a high proportion of the population causing distress and disability. They are more frequent among primary school children in both developing and industrialized countries. Dermatological problems constitute at least 30% of all outpatient visits to a Pediatrician and 30% of all visits to a Dermatologist involve children [9], [10].

Skin disorders in children may result in considerable discomfort, parental anxiety and embarrassment to the child and unnecessary absence from school and work. This in turn leads to loss of confidence and disruption of social relations, feeling of stigmatization and major changes in lifestyle [11]. Some skin disease also leads to major and minor complications. In our country, 100-150 million children are of school going age [2], [12].

Socio demographic factors such as age, gender, economic status, overcrowding etc. play a crucial role in determining the pattern of skin disorders in this age group [13]. Dermato-epidemiological data from population based studies are important in planning public health strategies

intended to control skin diseases. Information on the epidemiological characteristics and economic constraints in a particular area is required to formulate standardized recommendations for treating the common skin diseases prevalent there. Information on various socio demographic factors influencing the prevalence of skin disease could also be helpful. Most of the currently available studies are institution based or deal with a single disease entity alone. The results from specialized centers or referral centers cannot represent the situation prevailing in the general population due to possible selection bias. Moreover, almost all the data was derived from clinical examination alone, the validity of which depends on the dermatological expertise of the observers. Another common problem in interpreting the data from different studies is variation in the classification of disease categories. Thus population based prevalence studies are essential to estimate the true burden of skin disorders among children.

School survey is a useful yardstick as it is easy to conduct, less time consuming and a larger number of children of a particular age group can be screened for the presence of disease. This type of survey helps in detecting infectious diseases at an early stage. Earlier school based surveys conducted in various part of India showed that the prevalence of skin disorders among children has ranged from 4.3% to 49.1% [2], [3], [4], [5], [6], [7], [8]. Disease pattern in a given population is generally determined by different ecological factors. Rao SG[14], conducted a camp in an Indian village in Kerala to find out the skin diseases in the given population and concluded that improvement in the standard of living, education of the general public, improvement in the environmental sanitation and good nutritious food may help us to bring down the prevalence of skin disease.

In the present study, we have included students from both government and private schools in order to include students belonging to different socio-economic strata. There was a wide variation in the socio-economic class, nutritional status and hygiene standards among the students. The prevalence of skin disease in our study was 42.3%. Overall prevalence of skin disease and the most common condition, from comparable studies done elsewhere are shown in the following **table 1**. The wide variation in overall prevalence is evident. Pediculosis capitis was the commonest transmissible skin disease in our study. Few studies have yielded similar results [17], [18], [19]. However one study which included Indian subjects showed a lower prevalence of pediculosis capitis [16]. As regard non transmissible skin disease, Pityriasis Alba was the most frequent one. The results correspond with findings from other studies [16], [20].



Researcher	Study population	Year	Sample	Prevalence	Findings
Dogra S[15]	School children	2003	12,586	38.80%	Skin infestations 11.4%
	6-14 years				
	Chandigarh, India				
Rao SG[14]	School children	1999	1161	76.65%	Communicable dermatoses 19%, Nutritional deficiency 6.71%
	6-12 years				
	Mangalore, India				
Valia RA [16]	School children	1991	12481	54%	Pediculosis capitis 35%, Pityriasis alba 12%
	Above 4 years				
	Varanasi ,India				
Sharma NK [7]	School children  India	1986	3697	14.30%	Communicable dermatoses  and nutritional deficiencies

**Table 1:** Overall prevalence of skin disease and the most common condition, from comparable studies done elsewhere

Our study revealed an increasing prevalence of transmissible skin disease, with increasing age. This may be due to the fact that school children are exposed to newer risk factors as they grow older. Parental care also decreases as the child becomes independent. Children above seven years age perform most of their daily self-care and hygienic activities independently while those below seven years depend on their parents for most of their hygiene and grooming activities. As a result, hygienic practices by the child may be insufficient in maintaining good skin hygiene, in turn leading to increase in skin disease.

Gender based analysis revealed higher prevalence of transmissible skin disease among girls. However excluding Pediculosis capitis,

prevalence among girls was less when compared to boys. Pediculosis capitis was however much more prevalent in girls as against boys. Other studies have also substantiated these findings [21], [22]. Infestations were also significantly higher in girls as compared to boys. One interesting observation was that majority of parents did not consider pediculosis infestations seriously. Thus children, parents and teachers should be educated regarding timely detection and treatment of pediculosis infestation.

Most workers report a higher prevalence of skin disorders in lower socio economic class and our results also showed the same [20], [23], [24]. Educational status of the parents showed an inverse relation with the prevalence of skin disease especially transmissible. The relation was statistically significant. This is in accordance to findings from comparable studies [20], [25].

## Conclusion

In conclusion, the prevalence of skin disorders was high among the primary school children in the study area. This might be a reflection of the prevalence in the overall population of the area but skin diseases, especially infestations are not given due attention. Similar population based studies are required to estimate the burden of skin disorders and formulate appropriate strategies to prevent and treat them. Regular examination of school children by experienced doctors with the help of school authorities will help in reducing the prevalence of skin disorders in children and society.

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