

# Prevalence and Socio-Demographic Determinants of Skin Disease among Lower Primary School Children in Calicut, Kerala

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## ABSTRACT

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**Background:** Very few studies provide information on the prevalence and determinants of skin disease among children of school going age group in India.

**Aim:** To assess the prevalence and socio demographic determinants of skin disease among lower primary school children in Calicut, Kerala.

**Methods:** Study subjects included children of lower primary classes I to IV, aging from five to eleven years. Total of 919 subjects were studied from ten schools of Calicut Corporation chosen using multistage sampling method. Study period was from January to June 2006. Data was collected using a carry home questionnaire and clinical examination was done in the school. Prevalence of common skin diseases was calculated. The association between various factors and skin disease was compared using chi square test and level of significance was estimated with 95% confidence intervals and p value.

**Results:** The study revealed overall prevalence of skin disease to be 70.5 % (95% CI, 62.5%-78.6%). Prevalence of transmissible and non transmissible skin diseases were 61% and 31.8% respectively. Pediculosis capitis was the most frequent transmissible skin disease (52.6%) and pityriasis alba was the most frequent non transmissible skin disease (11.9%). Age of the child, number of children in the family and overcrowding showed statistically significant association with prevalence of skin disease in this population. Socio economic status did not demonstrate statistically significant association with prevalence of skin disease.

**Conclusion:** Skin disease constitutes a public health problem in this population and is not given due attention. Thus appropriate interventions are needed.

**Keywords:** School Children, Socio-demographic Determinants, Cross Sectional Study, Prevalence

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## INTRODUCTION

Skin disorders affect 20-30% of the general population at any one time.<sup>1</sup> Socio demographic factors play pivotal roles in determining the pattern of skin disease. Studies from India reveal wide variations in prevalence of skin disease among children.<sup>2,3</sup> There are hardly any studies focusing on children of Kerala. As school enrolment rate in Kerala is above 95%, information gathered from school children can provide insight into the community prevalence in this age group. Hence a survey was done to assess the prevalence and socio demographic determinants of skin disease amongst lower primary school children of Calicut, Kerala

## METHODS

Cross sectional study conducted in ten schools (five government schools and five private/aided schools) of Calicut city corporation area, an urban area in north Kerala with a population of 4, 36, 556 (census 2001). The study period was from January 2006 to June 2006. Multistage sampling including cluster sampling was used to select the desired sample of school children. The prevalence of skin diseases amongst children in reports from various parts of India range from 8.7% to 35% in school based surveys<sup>2</sup> and a prevalence of 15% was considered for sample size estimation. Based on calculations, the sample size required was 1024 and

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clusters required were ten.<sup>4</sup> Calicut City Corporation had 87 schools with lower primary classes. The schools were stratified as government schools or private/aided schools (37 government schools and 50 private/aided schools). Five schools were selected randomly from each stratum. Gender based stratification was not considered. Study subjects included children of lower primary classes I to IV, aging from five to eleven years. The study was approved by the Institutional Ethics committee. Consent was taken from the institutional heads of the selected schools and the District Educational Officer. Informed consent was also obtained from the parents of the children.

## STUDY OVERVIEW

Data was collected using a semi structured, carry home questionnaire which was pretested and modified. The questionnaire included socio demographic variables like age, gender, religion, educational status of parents, total number of family members, total number of children in family, type of school (government Vs private/aided) and birth order. The carry home questionnaire was filled by the parents. Socio economic status was assessed using modified Kuppusamy classification using per capita income, education and occupation.<sup>5</sup> The degree of overcrowding was expressed as the number of persons per room. Overcrowding was supposed to be present if there were two or more occupants per rooms.<sup>6</sup> Anthropometric measurements included height in meters; measured to the nearest 0.5 cm using a measuring tape and weight in kg; measured to the nearest 0.5 kg using a bathroom scale. Body Mass Index was also calculated. Initial screening by whole body skin examination was done by medical professionals who were adequately trained based on operational definitions for common skin conditions.<sup>7</sup> The diagnoses were made by a dermatologist in the team. Skin disease was defined as disorder exclusively or predominantly involving the superficial layer of the skin and disease was labelled as "Common skin disease" if it occurred frequently in the general population (prevalence >1%), or at a primary or peripheral healthcare level. Diseases were categorized as transmissible or non transmissible as per WHO guidelines.<sup>8</sup> For diagnosed skin conditions necessary advice, treatment, referral and health education was provided.

## STATISTICAL ANALYSIS

Data gathered using the questionnaire and clinical examinations were compiled, coded and entered in excel spreadsheets. Epi-info 3.3,<sup>9</sup> statistical software was

used for analyzing the data. Common skin diseases in the study population were measured in terms of Prevalence. Confidence interval of the prevalence was calculated using WINPEPI software.<sup>10</sup> The association between various factors and skin disease was studied and tested using chi square test ( $\chi^2$ ). Level of significance was estimated with 95% confidence intervals and p value

## RESULTS

Out of the estimated sample of 1024 subjects, we were able to gather complete information from only 919 subjects even after repeated visits (592 boys and 327 girls). Regarding age distribution, 44% subjects belonged to the under seven age group and 56% belonged to the above seven age group. Majority of the subjects were Hindus (62%). Most of the subjects belonged to the Upper lower socio economic class (71.3%) (Modified Kuppusamy classification). Around 74% of subjects were from private/aided schools and the rest from government schools (Due to lower student enrolment in government schools) Anthropometric measurements revealed that 68.1% of subjects were thin and 15.8% showed stunting (As per NCHS standard).<sup>11</sup>

## PREVALENCE OF SKIN DISEASE

The overall prevalence of skin disease was 70.5% (95% CI, 62.5%-78.6%). Nearly 38.4% of subjects had at least one skin disease, 22.3% had 2 skin diseases and 9.7% had three or more skin diseases. In general, prevalence of transmissible skin diseases was higher than non transmissible skin diseases (61% and 31.8% respectively). Pediculosiscapitis was the commonest transmissible skin disease with a prevalence of 52.6% followed by tineaversicolor (11.2%). Regarding non transmissible diseases, pityriasisalba showed the highest prevalence of 11.9% followed by insect bite reaction (8.1%) and ichthyosis (6.7%). The results have been summarized in figures 1 and 2.

### Socio-demographic determinants of skin disease

Age: Prevalence of skin disease was 66.3% in the under seven age group and 73.8% in the above seven years group. The association was statistically significant ( $\chi^2=6.043$ ,  $p=0.014$ )

Gender: Girls had significantly higher prevalence than boys (78.9% and 65.9% respectively). This difference was statistically significant ( $\chi^2=17.17$ , d.f.1,  $p<0.001$ ). Pediculosiscapitis was the commonest skin disease

among either sex (boys 42.7% and girls 70.3%). Infestations were significantly higher in girls when compared to boys (70.6 and 43.1% respectively) and the difference was statistically significant ( $\chi^2=64.24$  d.f.1,  $p < 0.001$ )

Educational status of parents: Educational status of mothers was higher than that of fathers. 70% of mothers and 48% of fathers completed matriculation. Prevalence of skin disease decreased with increase in the educational status of the parent. However this association was not statistically significant.

Number of family members: Prevalence of skin disease was higher among those staying in overcrowded conditions in contrast to those staying in not overcrowded conditions (72.9% and 63.3% respectively) and the association was statistically significant ( $\chi^2=7.43$ ,  $p=0.006$ )

Number of children in the family: Prevalence was 77.4% in subjects having more than two children in their family as against 63.7% in subjects having less than two children in their family. Prevalence of skin disease showed statistically significant increase as the number of children in the family increased ( $\chi^2=17.565$ , d.f 3,  $p < 0.001$ )

Type of school: Prevalence of skin disease was higher among government school children compared to private/aided school children (86.6% and 64.9% respectively). The association was statistically significant ( $\chi^2=40.26$ ,  $p < 0.001$ )

Birth order: Prevalence of skin disease increased with increase in birth order. Yet no statistically significant association was found

Socioeconomic factors: Skin disease was more prevalent among children from lower socioeconomic classes (lower class 70.7%; middle class 63.2%). The difference however was not statistically significant ( $\chi^2=3.58$ ,  $p=0.058$ )

## DISCUSSION

School going children are more frequently exposed to various risk factors. They are also ignorant of the risk factors and maintain close contact with other children. Socio demographic factors such as age, gender, economic status, overcrowding etc play a crucial role in determining the pattern of skin disease in this age group.<sup>12</sup> Skin diseases 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.<sup>13</sup> Some skin disease also leads to major and minor complications. 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 centres or referral centres cannot represent the situation prevailing in the general population due to possible selection bias. Moreover, almost all the data were 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 disease among children.

Table 1. Skin disease prevalence studies among children in India

Re-searcher	Study population	Year	Sample	Prevalence	Findings
Dogra S <sup>19</sup>	School children 6-14 years Chandigarh, India	2003	12,586	38.8%	Skin infestations 11.4%
Rao SG <sup>3</sup>	School children 6-12 years Mangalore, India	1999	1161	76.65%	Communicable dermatoses 19%, Nutritional deficiency 6.71%
Valia RA <sup>17</sup>	School children Above 4 years Varanasi, India	1991	12481	54%	Pediculosiscapitis 35%, Pityriasis alba 12%
Sharma NK <sup>2</sup>	School children India	1986	3697	14.3%	Communicable dermatoses and nutritional deficiencies

The overall prevalence of skin disease in our study population was 70.5% (95% CI, 62.5%-78.6%). Overall prevalence of skin disease and the most common condition, from comparable studies done elsewhere are shown in table 1. The wide variation in overall prevalence is evident. Pediculosiscapitis was the commonest transmissible skin disease. Few studies have yielded similar results.<sup>14,15,16</sup> However one study which included Indian subjects showed a lower prevalence of pediculosiscapitis.<sup>17</sup> As regard non transmissible skin disease, pityriasis alba was the most frequent one. The results correspond with findings from other studies.<sup>17,18</sup>

Gender based analysis revealed higher prevalence of skin disease among girls. However excluding pediculosis, prevalence among girls was less when compared to boys. Pediculosiscapitis was however much more prevalent in girls as against boys. Studies have substantiated these findings.<sup>20, 21</sup>

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. Our study revealed an increasing prevalence of skin disease, especially transmissible, 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. Number of studies suggested overcrowding as an important determinant of skin disease.<sup>18,22</sup> Our results also coincide with it. Another variable associated with statistically significant increase in prevalence of skin disease was the number of children in the family. Other studies uphold these findings.<sup>23</sup> As the number of children increases in the family, individual attention from parents decreases, which will affect the child's hygiene and thus favour transmission of communicable disease. Transmissible skin diseases were significantly higher in students of government schools. This could be explained by the fact that children from lower socioeconomic groups more often attend government schools. Most workers

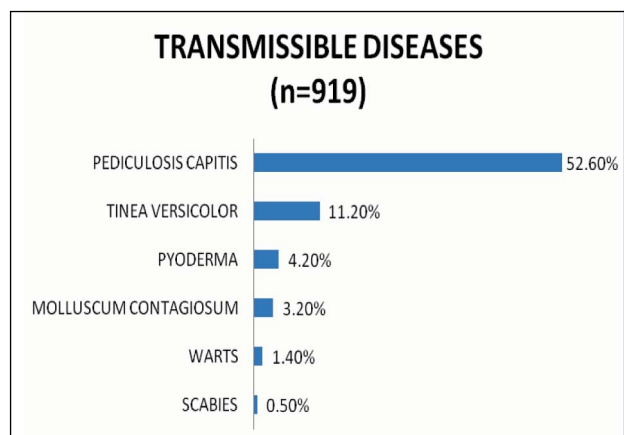


Figure 1. Prevalence of transmissible skin disease in the study population

report a higher prevalence of skin disease in lower socio economic class and our results also showed the same.<sup>18,22,24</sup> The difference however was not statistically significant. One comparable study had suggested that socio economic and cultural conditions are not relevant for infestation.<sup>15</sup> Educational statuses of the parents showed an inverse relation with prevalence of skin disease. But the relation was not statistically significant. This is in contrast to findings from comparable studies.<sup>18,25</sup>

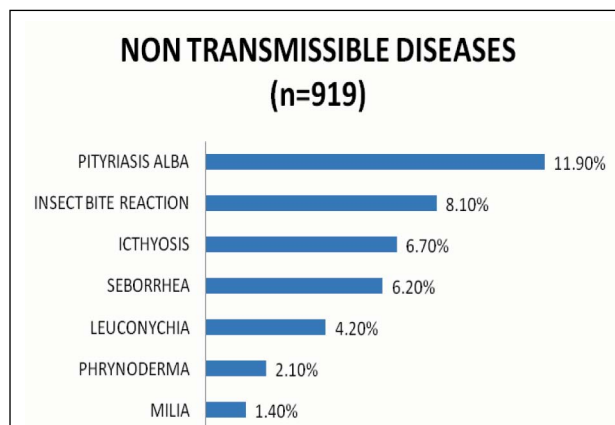


Figure 2. Prevalence of non transmissible skin disease in the study population

In conclusion, prevalence of skin disease was high among lower 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 the attention it deserves. Thus similar population based studies could be useful in estimating the burden of the condition and formulating appropriate strategies. We recommend steps to increase knowledge, attitude and practice among children regarding skin disease. They should be taught about risk factors for skin disease, control and prevention. Significance of timely detection and treatment should be stressed in school health programs. Child to child education program could be advocated for propagating hygienic habits in schools. Topics like personal hygiene and prevention of skin diseases could be integrated into school health club activities in the form of projects, seminars, poster exhibitions etc. Parents should also be educated regarding skin disease. Parent teacher association could serve as a suitable stage for discussing these issues. Infrastructure development and environmental hygiene is vital. Overall coverage and quality of school health checkups should be improved. Adequate emphasis should be given for training of doctors and community health workers in diagnosing and managing common dermatological conditions.

## END NOTE

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