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Original Research Article

Prevalence of scabies among school children living in urban Chidambaram and its associated risk factors: a cross sectional study

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ABSTRACT

Background: Scabies is one of the common contagious human skin diseases with prevalence of 0.2 to 71.4% around the world. Though all age groups are susceptible to scabies, children are at high risk. The study objective was to find out the prevalence and associated risk factors for scabies among the school children aged 11 to 14 years in Chidambaram.
Methods: This cross-sectional study was carried out among 11 to 14 years old school children between October to December 2019 in urban Chidambaram. Data was collected using a pretested semi structured questionnaire. Diagnosis of scabies was made by a trained investigator. Collected data were entered in Microsoft excel and analysed by using SPSS software version 23.
Results: Prevalence of scabies was found to be 22.4%. Three variables namely; age of the student, overcrowding, type of house was found to be statistically associated with scabies.
Conclusions: Modification of environmental risk factors like overcrowding, type of house, will aid in controlling the spread of scabies.

Keywords: Scabies, Prevalence, Risk factors, Overcrowding, Type of house

INTRODUCTION

Scabies is a skin infection caused by the mite *Sarcoptes scabiei var hominis* and is transmitted via skin-to-skin contact. It is one of the common human skin diseases. Scabies is transmitted mainly through direct route by prolonged contact with infected skin and indirectly through usage of contaminated personal objects.[1]

Every year more than an estimated 300 million cases of scabies occur, globally. The prevalence rates of scabies varies from 0.3 to 46% from country to country.[2] Pacific Island countries showed a higher rate of distribution than in many other countries (Haar and Romani et al). A study in Northern Ethiopia, Gondar town, among "Yekolo Temari" (Ethiopian orthodox church education attendants) revealed, the prevalence of scabies as 22.5%; while southern Ethiopia reported 5.5% prevalence among school children.[3] Western Europe reported a lower prevalence of scabies (Hay et al). A study conducted in rural areas of Salem, Tamil Nadu (South India) reported that the prevalence of scabies as 11%.[4]

Itching is the most commonly presenting symptom and the disease causes significant health illness either directly by infestation or indirectly through secondary bacterial infection. It can also leads to reduced work productivity, disruption of school attendance, sleep disturbance, and psychological repercussions.[4,5]

Scabies affects people of all ages, gender, socio economic classes. Though all age groups are susceptible to Scabies, children and immuno-suppressed individuals are the main risk group for scabies skin infection Heukelbach et al.[6]

The main factors which leads to a spread of the infection are, overcrowding, poor hygiene, sharing of beds which are mainly associated with poverty.[2]

In 2017, WHO added scabies to the list of neglected tropical diseases. This report also stated that certain steps like mapping the disease prevalence needs to be carried out before large-scale activities associated with scabies prevention and control can be begun.[7] Similar studies among school children to quantify the prevalence of scabies and its associated risk factors has never been conducted in the present study area. Hence the study was conducted to find out the prevalence of scabies and the risk factors associated with occurrence of scabies among the school children aged 11 to 14 years in Chidambaram.

METHODS

This cross-sectional study was conducted to find out the prevalence of scabies among 11 to 14 years of school children in government and private schools of urban Chidambaram. The study was carried out for a period of 3 months from October to December 2019.

There were 33 schools in urban Chidambaram, out of which one government school and one private school were selected conveniently. Permission for conducting the study was obtained from the school principal. All the students in the age group of 11 to 14 years were included as study participants. Written and oral informed consent obtained from the parents and study participants respectively.

Data was collected using a semi structured 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, and total number of children in family. Information on socio economic status and housing conditions were collected from the parents using a separate questionnaire.

Socio economic status was assessed using modified Kuppusamy classification. The degree of overcrowding was expressed as the number of persons per room. Overcrowding was present if there were two or more occupants per rooms.[8,9] 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.

Clinical examination was done by the investigator who was adequately trained for diagnosing scabies. scabies was defined as the presence of persistent pruritic rash with itching increasing at night which was notified at least at two specific body sites (on the wrist, sides and web spaces of the fingers, the axillae, peri areolar, per umbilical, genitalia area, abdomen, and buttock areas) with or without history of pruritus in the close entourage.[10] Study participants with scabies were given necessary treatment and referral if needed. Health education was given to all the study participants.

Statistical analysis carried out by collecting data were entered in Microsoft excel and analysed by using SPSS software version 23. Chi square test was used as the test of significance and was used to compare the differences in proportions with the significance level set at $p \leq 0.05$. Stepwise logistic regression module has been carried out to find out the odds ratio.

Ethical approval was obtained from institutional ethics committee of Rajah Muthiah medical college and hospital.

RESULTS

Total number of students included in the study were 192. Among 192 students 75 (39.1%) had completed 12 years, followed by 55 (28.6%) were 11 years old and 36 (18.8%) were 13 years old. 131 (68.2%) were males, 113 (58.9%) studied in government school and 79 (41.1%) studied in private school. 93 (48.4%) belonged to upper lower and 57 (29.7%) belonged to lower middle socio-economic status according to modified Kuppusamy's scale of classification (Table 1).

Table 1: Socio demographic details of the study subjects (n=192).

Socio-demographic variables	Number (N)	Percentage (%)
Age (years)		
11	55	28.6
12	75	39.1
13	36	18.8
14	26	13.5
Sex		
Male	131	68.2
Female	61	31.8
Type of school		
Government	113	58.9
Private	79	41.1
Socio-economic status (modified Kuppusamy classification)		
Upper and upper middle	6	3.1
Lower middle	57	29.7
Upper lower	93	48.4
Lower	36	18.8

Table 2 show personal hygiene characteristics of the study participants. Majority of the students reported that they took bath regularly, used soap for bathing, used footwear and dried their inner wears and bathing towels under sunlight. 14 (7.3%) students reported that they were not washing their clothes regularly.

Table 2: Distribution of variables related to personal hygiene of the study participants (n=192).

Personal hygiene variables	Frequency	Percentage (%)
Bath daily		
Yes	189	98.4
No	3	1.6
Soap used during bathing		
With water and soap	192	100
With water only	0	
Washing the clothes regularly		
Yes	178	92.7
No	14	7.3
Using footwear		
Yes	185	96.4
No	7	3.6
Drying the towel and inner wears under direct sunlight		
Yes	189	98.4
No	3	1.6

Table 3 show the housing condition of the study participants. Among 192 students 144 (85.9%) residing in pucca and semi pucca house and 48 (14.1%) students residing in hut. Overcrowding was found in 22.4% of the study participants.

Table 3: Variables related to housing conditions of the study participants (n=192).

Housing conditions variables	Frequency	Percentage (%)
Type of house		
Pucca and semi pucca	144	85.9
Hut	48	14.1
Cross ventilation		
Present	172	89.6
Absent	20	10.4
Family size		
≤4	66	34.4
5	81	42.2
>5	45	23.4
No. of rooms		
1	22	11.5
2	151	78.6
≥3	19	9.9
No. of accompanying people while sleeping		
≤2	142	74
3	21.4	21.4
4	8	4.2
Over crowding		
Present	43	22.4
Absent	149	77.6

Table 4 show the association between prevalence of scabies and selected socio-demographic and personal hygienic variables. A significant association exists between age and prevalence of scabies. We observed that scabies was prevalent in the age group 11 years. Similarly, there is an association between the frequency of cloth washing and the prevalence of scabies. Gender, type of school and socio-economic statuses was not associated with the prevalence of scabies in this study.

Table 5 show the association between the prevalence of scabies and housing conditions. There is an association between the type of house, cross ventilation, overcrowding, family size, number of rooms in house and number of persons sleeping in the bedroom and prevalence of scabies.

Stepwise logistic regression module has been carried out to find out the association between the prevalence of scabies and selected socio-demographic, personal habits family size and environmental variables. The following variables were included as independent variables: age, gender, social economic status, type of house, cross ventilation. overcrowding, cloth washing, family size and number of persons sleeping in the bedroom. Among the above said variables the following three variables have been identified as the most significantly associated variables with scabies; age of the student, number of persons sleeping in the bedroom and type of house.

The risk of having scabies was found to be 10 times higher among 11 years old children when compared to children of 14 years. The risk of developing scabies was found to be 10 times higher among the students who were residing in hut compared to students who were residing in either pucca or semi pucca house. Number of persons sleeping in the bedroom ≤2 was taken on the reference. A student sleeping with 3 family members were found to have 20.2 times increased risk of getting scabies compared to those sleeping with ≤2 members, similarly persons sleeping with 4 family members were found to have 47.8 times increased risk (Table 6).

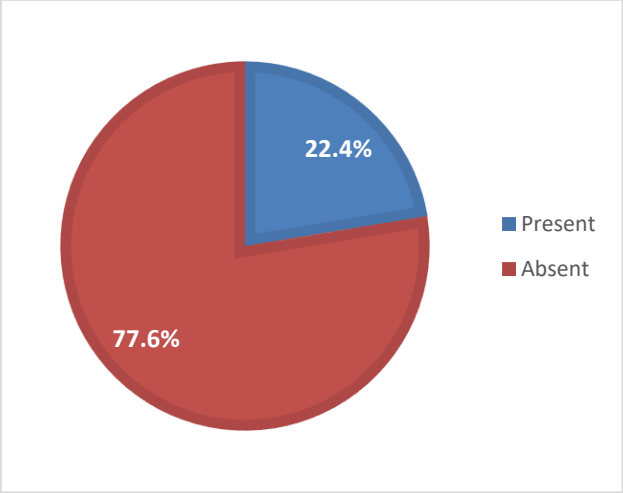

Figure 1: Prevalence of scabies.

The prevalence of scabies was found to be 22.4% in the present study.

Table 4: Association between prevalence of scabies and selected socio-demographic and personal hygienic variables (n=192).

Variables		Scabies		Chi-square value	P value
		Present (%)	Absent (%)		
Age (years)	11	27 (49.1)	28 (50.9)	33.425	<0.001
	12	12 (16)	63 (84)		
	13	2 (5.6)	34 (94.4)		
	14	2 (7.7)	24 (92.3)		
Gender	Male	26 (19.8)	105 (80.2)	1.541	0.214
	Female	17 (27.9)	44 (72.1)		
Type of school	Govt	21 (18.6)	92 (81.4)	2.296	0.130
	Private	22 (27.8)	57 (90.2)		
Socio-economic status	Upper and upper middle	1 (16.7)	5 (83.3)	0.315	0.957
	Lower middle	12 (21.1)	45 (78.9)		
	Upper lower	21 (22.6)	72 (77.4)		
	Lower	9 (25)	27 (75)		
Dress wash	Regular	35 (19.7)	143 (80.3)	10.490	<0.001

Table 5: Association between prevalence of scabies and housing conditions (n=192).

Variables		Scabies		Chi-square value	P value
		Present (%)	Absent (%)		
Type of house	Pucca and Semi pucca	24 (16.7)	120 (83.3)	10.878	<0.001
	Hut	19 (39.6)	29 (60.4)		
Cross ventilation	Present	33 (19.2)	139 (80.8)	9.788	0.002
	Absent	10 (50)	10 (50)		
Over crowding	Present	20 (46)	23 (53.5)	18.541	<0.001
	Absent	23 (15.4)	126 (84.6)		
Family size	≤4	23 (34.8)	43 (65.2)	13.382	<0.001
	5	8 (10)	73 (90)		
	>5	12 (26.7)	33 (73.3)		
Rooms	1	10 (45.5)	12 (54.5)	11.341	0.003
	2	26 (17.2)	125 (82.8)		
	≥3	7 (36.8)	12 (63.2)		
No. of people sleeping in bedroom	≤2	14 (9.9)	128 (90.1)	55.200	<0.001
	3	22 (53.7)	19 (46.3)		
	4	7 (87.5)	1 (12.5)		

Table 6: Multivariate logistic regression analysis (n=192).

Variables	B	S. E.	Wald	df	Sig.	Adjusted odds ratio	95% C. I. for odds ratio	
							Lower	Upper
Age (years)								
11	2.339	0.968	5.841	1	0.016	10.374	1.556	69.155
12	0.893	0.998	0.800	1	0.317	2.442	0.345	17.257
13	-0.242	1.167	0.043	1	0.836	0.785	0.080	7.733
14			15.192	3	0.002			
Type of house								
Residing in hut	2.304	0.585	15.496	1	<0.001	10.014	3.180	31.533
No. of people sleep								
3 members	3.008	0.592	25.831	1	0.000	20.246	6.347	64.583
4 members	3.868	1.164	11.041	1	0.001	47.848	4.886	468.532
Constant								
4.428	1.028	18.570	1	0.000	0.012	--	--	--

DISCUSSION

This study was conducted in the schools of urban Chidambaram to find out the prevalence of scabies and its risk factors among the school going children aged 11 to14 years. The present study showed that the prevalence of scabies was 22.4%. Similar results was reported by a study conducted at Wardha district, India (18%).[10] A study done by Dange et al reported that prevalence of 9.3% among school children in northwest Ethiopia.[3] Another study conducted by Steer et al reported a similar prevalence of 18.5%.

A higher prevalence of scabies was reported by a study done at West Bengal India (42%). Another study from Pakistan reported the prevalence as 47.6%.[12,13] Similar higher prevalence were also reported by Osti et al from Solomon islands schools.[11] This difference might be due to the difference in socio- economic characteristics between the study areas.

The current study found that 18.6% of government school going children and 27.8% of private school going children had scabies. This is much lower when compared to a study conducted by Mir et al who reported that the prevalence among government and private school going children were 53.47 and 46.52% respectively.[12]

Regarding personal hygiene, findings from this study revealed that infrequent washing of clothes was positively associated with scabies. A person who is washing clothes infrequently had 3 times increase risk of getting scabies than a person who is washing clothes frequently was reported in an Ethiopian study. Several studies conducted in Pakistan, Brazil, Egypt, Ethiopia had also reported a similar association between infrequent washing of clothing and scabies.[10,13] This result shows that scabies mites can survive in clothing for a longer period.

After applying multivariate logistic regression, the variables that were found to affect the occurrence of scabies independently were younger age of children, sleeping in a room accompanied by more than 2 persons and kutcha house. Students who were 11 years were found to have increased risk of getting scabies than those who were 14 years of age. Similar observation was reported by Jose and Dagne et al.[3,4]

A student accompanied by more than 2 persons while sleeping were found to be at increased risk of getting scabies than those who were accompanied by either 2 or less than 2 persons. These findings are comparable to studies conducted by Tunje et al.[14]

A person living in kutcha house is at 10 times increased risk of getting scabies infection than a person living in either pucca or a semi pucca house. This findings were in accordance with finding of Yasmin and Sindayo et al.[2,6]

Limitations

Being a convenient sample, the generalization of the results should be carried out with proper care.

CONCLUSION

Prevalence of scabies was found to be 22.4%. Age of the student, overcrowding, type of house was found to be statistically associated with scabies. Modification of environmental risk factors like overcrowding, type of house, will aid in controlling the spread of scabies. Health education regarding personal hygiene practises will decrease the prevalence of scabies in school children.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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