



## Prevalence and Pattern of Transmissible Skin Diseases among Primary One School Pupils in Kumbotso L.G.A Kano State

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### Abstract

School entrants are naive to the school environment, which is known to be an ideal place for the spread of transmissible skin diseases (TSDs). Skin diseases in this group of children are likely to reflect their immediate home environment and community sanitation. The study therefore aims to determine the prevalence and pattern, as well as the socio-demographic determinants of TSDs in primary one school pupils. One thousand one hundred and fifty two pupils were studied using a multi-stage sampling technique with proportional allocation. Data was collected using a structured questionnaire following which a complete head to toe examination was done. The diagnosis of TSDs was mainly clinical using diagnostic criteria. The prevalence of TSDs was 36.3%. Fungal infections were the commonest (32.5%), while scabies, bacterial and viral infections accounted for 3.2%, 2.5% and 1.3% respectively. Thirty-six (8.6%) pupils had multiple diseases. Age, gender, being in public school, overcrowding, large family size, poor hygiene, bathing without soap and keeping of animals were found to be significantly associated with TSDs ( $p < 0.05$ ). On logistic regression, Male gender ( $p < 0.05$ ), being in public schools ( $p < 0.05$ ), overcrowding ( $p < 0.05$ ) and keeping of animals at home ( $p < 0.05$ ) remained positive predictors of TSDs. Good hair hygiene ( $p < 0.05$ ) and good nail hygiene ( $p < 0.05$ ) were found to be protective against the development of TSDs. The study therefore showed that transmissible skin diseases are common in primary one school pupils and is likely to be a reflection of the community where they come from.

**Keywords:** Prevalence, Transmissible skin diseases, School entrants.

## Introduction

Transmissible skin diseases are the most frequent diseases of school children in many developing countries.<sup>1</sup> Schools are ideal places for the spread of infectious diseases because of the large number of young people of different ages in close contact with one another, some of whom may not have developed good personal habits of hygiene or immunity to various skin diseases. In a review of prevalence studies in children by the World Health Organization (WHO) the prevalence of skin diseases ranged from 21% to 87%.<sup>2</sup> School entrants are naïve to the school environment and most of them would not have been exposed to exotic skin diseases occasioned by movement outside their immediate home environment and communities. Skin diseases in this group of children are likely to reflect their immediate home environment and community sanitation. The study is therefore aimed to determine the prevalence and pattern of transmissible skin diseases among school entrants' pupils in Kumbotso LGA of Kano state and to determine the influence of factors like age, gender, socioeconomic status and living conditions on transmissible skin diseases.

## Subjects and Methods

This was a descriptive cross sectional study carried out among primary one school pupils in Kumbotso LGA of Kano state. Kumbotso LGA is located in the south western part of Kano state. It is semi-urban and has 229 primary schools of which 135 are public and 94 are private schools. The study was conducted between October 2014 and March 2015. The sample size was computed using the prevalence of transmissible skin diseases of 49.2% from a previous study.<sup>3</sup> Based on calculations, sample size required was 1174. Ethical approval was obtained from the institutional Medical Research Ethics Committee. Consent was obtained from the State Primary Education Board and local government education authority. Informed consent was also obtained from the parents/caregivers of the children.

A multistage sampling technique with proportional allocation was used to select the subjects as follows:

**Stage 1:** selection of schools:- there were 229 primary schools (135 public and 94 private primary schools) in the Local Government Area. The total number of schools selected was obtained using a proportionate sampling outcome of 30%. Thus 69 primary schools were selected. Using proportionate allocation of the ratio of public to private schools of 135: 94, which is equivalent to a ratio of 1.4:1, 41 public and 28 private primary schools were selected by simple random sampling method.

**Stage 2:** The 1174 pupils were proportionately recruited from the 69 selected schools, based on the population of primary one school pupils in each school.

**Stage 3:** In each school the number of pupils to be sampled, were shared among the arms of primary one proportionately based on the population of each class

**Stage 4:** In each arm, a list of the pupils with their names arranged alphabetically was extracted from the class register. The pupils were then grouped and stratified on the basis of gender. Here, selection of pupils was also proportionate, based on the relative ratio of each subgroup.

**Stage 5: Selection of pupils:** - Sampling ratio was determined for boys and girls in each class arm then systematic sampling method was used to recruit the 1174 pupils.

Data was collected using a pretested structured questionnaire to obtain information on socio-demographic variables like age, gender, religion, ethnicity, educational and occupational status of the parents/guardians, total number of family members, and number of rooms' type of pets and school. The first section of the questionnaire was carried home to be filled by the parents/guardians a week before the dermatological examination. Socio-economic status was assessed according to the method suggested by Oyediji.<sup>4</sup> In this method, the social class of each pupil was determined from the occupational and educational levels of both

parents using standard scoring scales on both the occupational and educational level for each parent. The degree of overcrowding can best be expressed as the number of persons per room and determined by calculating the number of persons in the household divided by the number of rooms in the dwelling or apartment. The hygiene habits of the children were assessed through a personal interview with the children on the day of their examination. A complete physical examination was conducted in a well-lit classroom in the presence of a chaperone, with each pupil in their under wear and general physical appearance with particular attention to cloth hygiene, hair and nails hygiene were noted. Diagnosis of transmissible skin diseases was made on clinical grounds using key diagnostic criteria and appropriate skin scraping and swabs were taken to confirm diagnosis.

Data was analyzed using the statistical package for social sciences (SPSS) software version 16.0 for Windows (SPSS Inc., Chicago, USA). Frequency distributions of relevant variables were generated and represented in tables and charts.

Continuous variables were expressed as mean and standard deviation while categorical variables were expressed as proportions, ratios and percentages. Chi square and t test were used to test for associations between categorical and continuous variables respectively. Fisher's exact test was used for variables with frequencies less than five. A p value of  $< 0.05$  was considered significant. Multiple logistic regression analysis was used to determine predictors of TSDs. Odds ratio and its corresponding 95% CI were calculated.

### Results

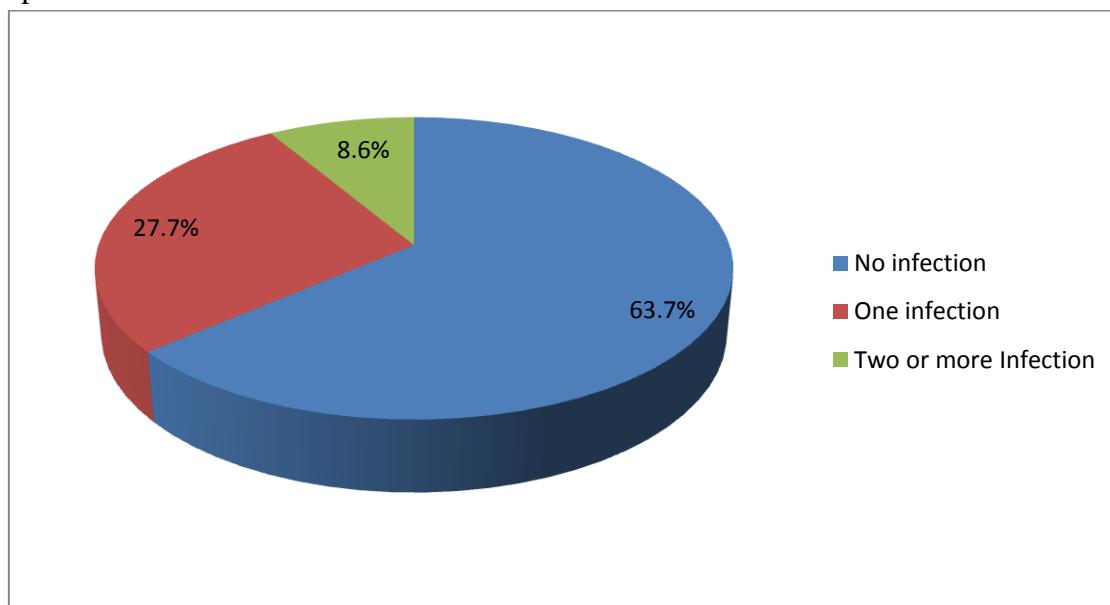
A total of 1174 pupils were recruited for the study however only 1152 pupils completed the study. The ages of the pupils ranged from 6-14 years with a mean age of  $7.20 \pm 1.2$  years. Majority (92.1%) of the subjects were in public schools, More than half of the pupils (53.6%) belonged to social class III and came from households consisting of 6-10 members (54.5%). These are shown below in Table I

**Table I:** Socio-demographic characteristics of the pupils.

	Frequency	Percentage (%)
<b>Age group (years)</b>		
6-7	762	66.1
8-9	349	30.3
10-11	34	3.0
>11	7	0.6
<b>Gender</b>		
Male	609	52.9
Female	543	47.1
<b>Type of school</b>		
Public	1061	92.1
Private	91	7.9
<b>Type of Family</b>		
Monogamous	734	63.7
Polygamous	415	36
Single	3	0.3
<b>Social class</b>		
I	0	0
II	9	0.8
III	617	53.6
IV	383	33.2
V	143	12.4
<b>Total no of household members</b>		
1-5	298	25.9
6-10	628	54.5
11-15	169	14.7
>15	57	4.9

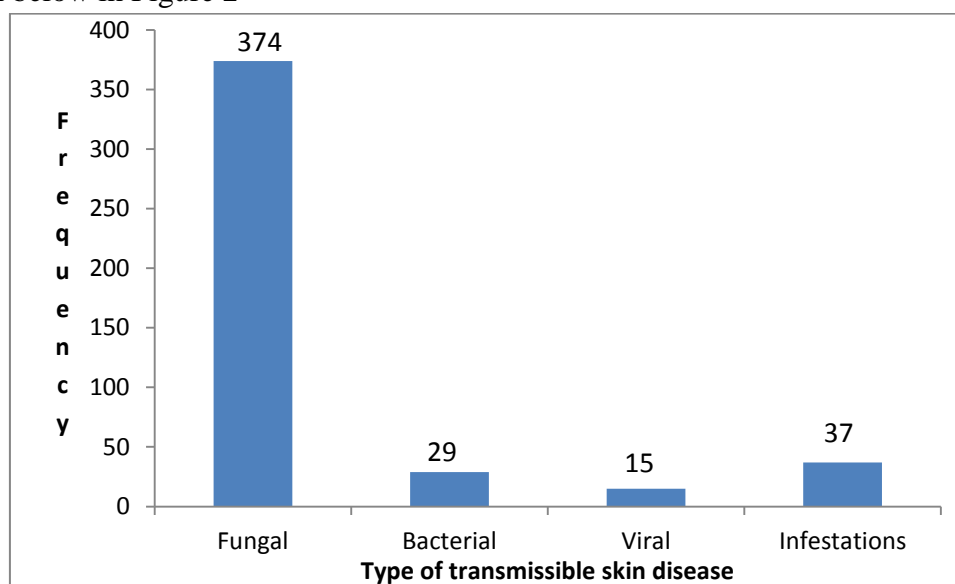
**Prevalence of transmissible skin diseases**

The overall prevalence of TSDs was 36.3% of which 8.6% had two or more diseases as shown in Figure 1.



**Figure1:** A Pie chart showing the prevalence of transmissible skin diseases among the pupils

Fungal infection was the commonest type of transmissible skin diseases with a case prevalence of 89.5%. This is as shown below in Figure 2



**Figure 2:** A bar chart showing the frequency of transmissible skin diseases among the pupils

Table II: shows that tinea capitis accounted for the majority (32%) of fungal infections. Folliculitis (1.6%) was the commonest bacterial infection while warts (1.0%) and scabies (3.2%) were the commonest viral infection and infestation seen

respectively. TSDs were generally more common in boys than in girls except for folliculitis which occurred more in girls. This was statistically significant for tinea capitis, tinea corporis and scabies ( $p < 0.05$ ).

**Table II:** Prevalence and pattern of transmissible skin diseases by gender

Transmissible skin Diseases#	Frequency			p value
	Males n (%)	Females n (%)	Total n (%)	
<b>Fungal</b>	<b>246</b>	<b>128</b>	<b>374</b>	
Tinea capitis	241(20.9)	128 (11.1)	369 (32)	0.001*
Tinea corporis	9 (0.8)	0 (0)	9 (0.8)	0.004†*
Tinea faciei	1 (0.1)	0(0)	1 (0.1)	1.000†
Tinea unguium	1 (0.1)	0 (0)	1 (0.1)	1.000†
<b>Bacterial</b>	<b>15</b>	<b>14</b>	<b>29</b>	
Folliculitis	6 (0.5)	12 (1.0)	18 (1.6)	0.094
Impetigo	7 (0.6)	1 (0.1)	8 (0.7)	0.073†
Carbuncle	2 (0.2)	1 (0.1)	3 (0.3)	1.000†
<b>Viral</b>	<b>10</b>	<b>5</b>	<b>15</b>	
Warts	7 (0.6)	4 (0.3)	11 (1.0)	0.554†
Molluscum contagiosum	5 (0.4)	1 (0.1)	6 (0.5)	0.222†
<b>Infestation</b>	<b>27</b>	<b>10</b>	<b>37</b>	
Scabies	27 (2.3)	10 (0.9)	37 (3.2)	0.013*

\* statistically significant † fishers exact test# some pupils had more than one type of TSDs

**Table III:** Logistic regression analysis of the factors found to be associated with TSDs.

Variable	Adjusted OR(95% CI)	p value
<b>Age category</b>		
6-7	1.67(0.73-3.80)	0.22
8-9	1.20(0.52-2.80)	0.67
≥10	<b>Referent</b>	
<b>Gender</b>		
Male	2.14(1.61-2.85)	0.0001*
Female	<b>Referent</b>	
<b>School type</b>		
Public	2.08(1.06-4.10)	0.03*
Private	<b>Referent</b>	
<b>Household No</b>		
1-5	2.80(1.31-5.98)	0.008*
6-10	2.96(1.44-6.09)	0.003*
11-15	2.15(0.99-4.68)	0.05
>15	<b>Referent</b>	
<b>Overcrowding</b>		
Yes	1.41(1.04-1.91)	0.03*
No	<b>Referent</b>	
<b>Keep animals</b>		
Yes	1.34(1.01-1.80)	0.04*
No	<b>Referent</b>	
<b>Clothing</b>		
Good	1.30(0.62-2.75)	0.49
Fair	0.81(0.58-1.14)	0.23
Poor	<b>Referent</b>	
<b>Nail</b>		
Good	0.35(0.17-0.69)	0.003*
Fair	0.70(0.51-0.95)	0.02*
Poor	<b>Referent</b>	
<b>Hair</b>		
Good	0.05(0.01-0.10)	0.0001*
Fair	0.27(0.20-0.36)	0.0001*
Poor	<b>Referent</b>	

\*statistically significant, OR- Odds ratio, CI- Confidence interval

## Discussion

The prevalence of transmissible skin diseases in this study is high and considering the study population who are school entrants; this could imply that conditions which predispose them to transmissible skin diseases are likely to be prevalent in their home environment. The findings in this study are similar to the prevalence rate of 40.4% reported by Oyedeji et al<sup>5</sup> in Ijesha. However higher rates were reported by Dagnew et al<sup>3</sup> (49.2%) and Figueroa et al<sup>6</sup> in Ethiopia (80.4%). These high rates could be due to the fact that the studies were carried out in typical rural communities with severely defective environmental conditions.

Multiple transmissible skin diseases were found in 8.6% of pupils in this study. Kalu et al<sup>7</sup> and Amoran et al<sup>8</sup> also reported rates of 13% and 13.8% respectively. Generally the presence of multiple infections indicate high transmission rate and the prevalence in this study is as expected, because factors such as poor hygiene and sordid environments (which exist in this study) enhance the transmission efficiency of infectious dermatoses pathogens.

Fungal infections were the commonest TSDs in this study. This agrees with the findings of previous studies reported by Ogunbiyi et al<sup>9</sup> in South western, Nigeria and Komba et al in Tanzania.<sup>10</sup> The reason for this may be linked to the various factors observed in this study such as poor personal hygiene, close association with domesticated animals, high household density and overcrowding which are known to favour transmission of dermatophyte infections. A possible explanation for the low prevalence of bacterial infections in this study when compared with the higher rates reported by Emodi et al<sup>11</sup>, could be the timing of the study (dry season) since it is well known that rainy season tends to favour bacterial infections due to the increased humidity.<sup>2</sup> Folliculitis was the predominant bacterial infection in this study followed by impetigo. This is consistent with the findings by Komba et al<sup>10</sup> and Amin et al<sup>12</sup>

Viral skin infections constituted 1.3%, with warts having a prevalence of 1.0% and molluscum contagiosum having a prevalence of 0.5% in this study. Libu et al<sup>13</sup> reported warts having similar rates of 1.4% respectively. However, Oyedeji et al<sup>5</sup> reported a slightly higher prevalence of 1.8% (warts) possibly due to the increased frequency of communal baths and swimming in infected water among the rural pupils studied.

Scabies was the commonest infestation observed in this study with a prevalence of 3.2%. This is also in tandem with the findings reported by Oyedeji et al in Ilesha<sup>5</sup> and Audu et al in Zaria<sup>14</sup>. Factors that are likely to have contributed to this prevalence include crowded living conditions resulting in close personal contact and poor personal hygiene.

Age is the most important factor that alters the prevalence and pattern of skin diseases. In this study, the prevalence of TSDs decreased with increasing age and was found to be commoner in pupils aged less than ten years. This is comparable with findings in previous studies across Nigeria.<sup>5,15,16</sup> This is likely to reflect the home environment since pupils in this age group are not able to cater for themselves adequately and hence depend on their parents for most of their hygiene and grooming activities

Analysis by gender revealed a significantly higher prevalence of TSDs among boys who were found to be two times more at risk of having TSDs when compared with girls in this study. The boys also had a higher rate of fungal infections and this corroborates with the findings of other studies.<sup>17,18</sup> This may be attributed to the very short hair of boys, exchange of caps and mutual rough handling during play. For bacterial infections, a similar trend was seen except for folliculitis, which showed a female predilection. This could be due to the tight braiding of their hair causing traction folliculitis.

Pupils in public schools were found to be two times at risk for having TSDs. Reasons for this observation could be due to the increase precision from the larger number of pupils in public schools compared to the pupils in the private schools and

overcrowding as a result of the large population of pupils in the public schools with few classroom blocks as some of them had to sit outside under the trees to receive their teachings thus, increasing the chances of transmission of TSDs. In addition, children from low socioeconomic class are more likely to attend public schools than private schools. Libuet al<sup>13</sup> also reported similar findings. Findings from this study showed that there was an inverse relation of socio economic class on TSDs. Earlier studies<sup>5,13,19</sup> carried out within and outside Nigeria have reported higher prevalence of skin diseases in lower socioeconomic class. Similarly, Libuet al<sup>13</sup> also observed that the difference was not statistically significant.

Almost two-thirds of the pupils in this study lived in overcrowded conditions characterized by large family size. This results in frequent close contact between family members and it is not surprising to find out that TSDs were significantly associated with large family size and overcrowding. This shows that the risk for TSDs increases with increase in household population and is comparable with findings from previous studies.<sup>5,13,19</sup>

Domestic animals are known to be good reservoirs for TSDs and contact with animals is considered a risk factor for dermatophytoses specifically, tinea capitis. In this study, a large proportion of the pupils were in contact with animals. Similarly, other studies have shown close relationship between TSDs and contact with domestic animals.<sup>12,15,20.</sup>

### Conclusion

The study showed that transmissible skin diseases are common in primary one school pupils and this is likely to be a reflection of the community where the children are from. Thus, it is important to emphasize on the promotion of good hygienic practices and improved living conditions of the family.

### Recommendation

There is need to revive the school health programme as this will create the opportunity to identify and treat these skin ailments. Health education of the populace via mass media may go a long way in reducing the burden of transmissible skin diseases in the community.

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### Conflict of Interest

None declared

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