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## KNOWLEDGE, PREVALENCE AND PREVENTION OF DERMATOPHYTE INFECTIONS AMONG PRIMARY SCHOOL PUPILS IN UYO METROPOLIS

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### ABSTRACT

The study examined the knowledge, prevalence and prevention of dermatophyte infection among primary school pupils in Uyo metropolis. Four research questions were raised and the corresponding hypotheses were formulated to guide the study. A descriptive survey research design was used for the study. The population of this study consisted of 420 pupils from 20 selected primary schools. The selected schools were 5 schools each from the northern, eastern, southern, and western Uyo metropolis. The researcher developed an instrument titled 'Knowledge-of-Infectious-Disease-Questionnaire' for data collection. Face validity, content validity, construct validity, and reliability testing were used to validate the instrument. Simple percentage was used for answering research questions while Chi-square ( $\chi^2$ ) test was used for testing the hypotheses. An average of 61.59% of the pupils lacked knowledge of dermatophyte infection while 70.6% of them already had the infections indicating a lack of significant knowledge, but significant spread of dermatophyte infection respectively, among the pupils at  $p < 0.05$ . Furthermore, an average of 52.2% of the pupils showed no significant knowledge of the causes, prevention and treatment of the infection, while 53.2% had their academic performances negatively affected due to the dermatophyte infection. Based on these findings, it was concluded that although there exists a high prevalence of dermatophyte infection among primary school pupils, knowledge, prevention and treatment is however low. Academic performance is also negatively impacted due to the infections. It is recommended that parents should keenly observe their wards for symptoms of these infections and promptly effect treatments to avoid disease spread onto classmates. Also, proper enlightenment of these children about dermatophyte infections should be done both by the parents and Government Health Workers.

**KEYWORDS:** Dermatophyte infection, Prevalence, Prevention, Pupils, Questionnaire.

### INTRODUCTION

In the tropical and subtropical regions of the world like Nigeria where warm and humid climates provide a favorable environment for fungal infections, dermatological problems manifesting as primary and secondary cutaneous infections are prevalent (Enemuor and Amedu, 2009). The most common type of dermatophytosis among children of primary school age (6 to 12 years) is *Tinea capitis* – ringworm of the head. In some individuals, this may manifest with symptoms while in other children there may be no symptom. These asymptomatic children remain untreated and become reservoirs of infection in close association with uninfected populations (Odum, 2005; Ikit *et al.*, 2007; George and Altraide, 2008; Adegoke and Komolafe, 2008; Ikit, 2010).

Dermatophytoses are contagious in nature and can be transmitted through body contact especially in crowded settings or through inanimate objects like clothes, combs or hair dresser equipment (Enemuor and Amedu, 2009). Children are highly predisposed to dermatophytosis due to inadequate amount of inhibitory fatty acids usually produced by adults' skin. Moreover, children's interaction patterns also increase the risk of acquiring the fungal infections through body contacts. Other factors like poor living conditions marked by poor sanitation, housing, limited water supply as well as limited economic power increase the possibility of acquiring and harboring such skin infections (Anosike *et al.*, 2005).

Dermatophytoses inflict a lot of psychosocial traumas due to attached social stigma, ulceration, and sometimes irritation

which hammers pupil's attention in class. They also may represent potential sources of secondary bacterial infections. It is not generally appreciated how disabling a skin disease can be since an apparent rash to the teacher, may be a source of intense discomfort to the sufferer. Children are more sensitive to scolding and stigma from others (Koo *et al.*, 2000). Ringworm infection is not a notifiable disease, but is a cause for concern because of its contagious nature. It can be transmitted through body contacts especially in crowded settings like the public primary schools where pupils may exceed fifty (50) in class (Adefemi *et al.*, 2011)

Due to their tender age, most of these pupils have no knowledge of the causative agents of ringworm, or ways of preventing or even treating dermatophyte infections. Also, their knowledge of personal hygiene and actual ability to carry out personal hygiene is very limited. All these factors contribute to the high prevalence of dermatophyte infections among these primary school children. The present study was aimed at exploring the knowledge, prevalence and prevention of dermatophyte infection among primary school pupils in Uyo metropolis.

### METHODS

#### Study Area

The research area covered the primary schools within Uyo metropolis. Uyo Local Government Area is bounded in the North by Etinan, in the South by Uran, in the East by Ibiono and in the West by Itu local Government Areas. Uyo metropolis is an urban area with many governments owned primary schools. There are also Church owned primary and

nursery schools. Individually owned (private) nursery and primary schools are also numerous within the metropolis, but these were left out of the research work for fear of offending the private proprietors. The people of Uyo are predominantly traders and civil servants. Many churches are found within these Local Government Areas. There are also important healthcare facilities. (George and Altraide, 2008).

### Research Design

The study was a descriptive survey involving junior primary (one to three) pupils in the selected primary schools in Uyo metropolis. Through interview, structured questionnaire was administered to pupils clinically suspected of dermatophyte infections. All assenting junior primary pupils in the selected primary schools whose parents had given a written consent for their inclusion in the study were included, while those without permission were left out. Pupils without any skin lesion or with skin lesion which did not meet the clinically suspected diagnostic criteria of dermatophyte infections were also left out.

### Study population

All schools used for this study were public schools with crowded classrooms and inadequate facilities. Majority of the pupils were between 4-14 years old although those used for the study were 5-8 years old (junior primary 1-3). The pupils were from low income socioeconomic class owing to government policy of free education. Pupil from high income brackets were seen in the private nursery and primary schools. The population for the study consisted of four hundred and twenty (420) pupils from 20 selected primary schools. The randomly selected schools were five (5) schools each from the northern, eastern, southern and western Uyo metropolis.

### Sample and Sampling Technique

By simple random sampling, twenty (20) primary schools were selected in the study area. Twenty-one pupils from junior primary sections (Primary 1-3) of each school were randomly sampled giving a total of (420) pupils. The selection made through random sampling techniques was one of the most achievable instruments of determining the prevalence of dermatophytic infections among the pupils, and the knowledge of prevention of such infections possessed by the pupils. The effects of the infections on the pupils' academic performances were also studied.

### Research instrument

A Knowledge-Of-Infectious-Disease questionnaire was administered on the pupil by oral interview. The questionnaires contained a total of 25 questions in five sections A to E. Questions were targeted at discovering the knowledge of the pupils about prevalence, causes, prevention and treatment of dermatophyte infections.

### Method of Data collection

The Knowledge-Of-Infectious-Disease questionnaire was taken to the selected primary schools in Uyo metropolis and distributed. The questions were read out to the pupils who then ticked their responses on the questionnaire. The questionnaires were collected and responses analyzed.

### Data analysis

Simple percentage was used for answering the research questions while Chi-square ( $\chi^2$ ) was used for testing the hypothesis at  $p < 0.05$  level of significance.

### RESULTS

Out of 420 copies of the questionnaire administered to the pupils, 414 copies were correctly filled and retrieved representing 99% return rate. Table 1 shows the result of the extent of knowledge of dermatophyte infection among primary school pupils in Uyo metropolis. From the table, 78% of the pupils failed to recognize the fact that the appearance of white scaly patches on their head with itchy was a symptom of ringworm of the head – *Tinea capitis*, a type of dermatophyte infection. Again, 67% of them did not understand that ringworm of the body – *Tinea corporis* appears like circular rash on the bare body and arms. Furthermore, 81% of the pupils assumed that bruises on their legs and arms could also be called ringworm. Only 44% of them recognized that the intense itchy patch between their toes, oozing out water was ringworm of the toes – *Tinea pedis*. But 89% of these pupils were able to state that the boil on their nose was not a ring worm. An average of 38.41% of the pupils were able to identify the presence of dermatophyte infection on their bodies, while 61.59% could not. The calculated Chi-square (CA  $\chi^2$ ) value was 8.56 and was less than the critical Chi-square (Crit  $\chi^2$ ) value of 9.49 at  $p < 0.05$  and at 4 degree of freedom.

In response to research question two, "What is the extent of spread of dermatophyte infection among primary school pupils in Uyo metropolis?" Table 2 revealed the extent of spread of dermatophyte infection among primary school pupils in Uyo metropolis. From the table, it can be seen that 89% of the pupils had reddish, itchy patches on their bare bodies, 79% had white, scaly, itchy, hairless patches on their heads. Fifty-eight percent (58%) had discoloured patches on their skin even though these were not itchy. Eighty-three (83%) percent of these pupils revealed that their classmate equally had similar skin infections. On the average 70.6% of the pupils had dermatophyte infection, while 29.4% were free from the infection. The calculated Chi-square (CA  $\chi^2$ ) value of 26.88 was much higher than the critical Chi-square (Crit  $\chi^2$ ) value of 9.49 at  $p < 0.05$  and at 4 degree of freedom.

In response to research question three, "Do the primary school pupils know about the causes, prevention and treatment of dermatophyte infection in Uyo metropolis?" Table 3 revealed the extent of knowledge of the pupils about the causes, prevention and treatment of dermatophyte infections. As can be seen, 91% of the pupils said that ringworm of the head was caused by pouring sand on their heads while 80% believed that sharing towels, combs and hair brushes with other people who have ring worm will not cause ringworm on them.

Furthermore, 59% of the pupils believe that playing in the grass can cause ringworm while 78% indicated that playing with a class mate who is already infected with ringworm, will not get them infected.

**TABLE 1:** Simple percentage of the extent of knowledge of dermatophyte infection among primary school pupils in Uyo metropolis

S/N	Knowledge of dermatophyte infection among primary school pupils			CA $\chi^2$	Df	Crit $\chi^2$
		Yes (%)	No (%)			
1	Appearance of white, scaly patches on my head with itching is probably ringworm.	92 (22)	322 (78)	8.56	4	9.49
2	Ringworm of the body appears like circular rash on the bare body and arms.	138 (33)	276 (67)			
3	Bruises on my legs and arms can also be called ringworm.	335 (81)	79 (19)			
4	Is intense itchy patch between my toes, oozing out water ringworm of the toes?	184 (44)	230 (56)			
5	The boil on my nose can also be seen as ringworm.	46 (11)	368 (89)			
	<b>Mean</b>	159 (38.41%)		255 (61.59%)		

In considering possible treatment of the infection, 68% of the pupils said they squeezed sap from papaya leaves are rubbed on the spot while 80% said they scrubbed the spot with guava leaves. Only 9% of pupils said they washed the spot and rubbed an antifungal cream on it. Ninety percent (90%) indicated that they use hot water and salt to treat their

infection. Only an average of 47.8% of the pupils were able to state the causes, prevention and treatment of dermatophyte infection, while 52.2% could not state these. The calculated Chi-square (CA  $\chi^2$ ) value of 15.07 was less than the critical Chi-square (Crit  $\chi^2$ ) value of 16.92 at  $p < 0.05$  at 4 degrees of freedom.

**TABLE 2:** Simple percentage of the extent of spread of dermatophyte infection among primary school pupils in Uyo metropolis.

S/N	Spread of dermatophyte infection among primary school pupils			CA $\chi^2$	Df	Crit $\chi^2$
		Yes (%)	No (%)			
6	Do you have reddish, itchy patches on your bare bodies?	368 (89)	46 (11)	26.88	4	9.49
7	Do you have intense itchy patches between your toes	181 (44)	233 (56)			
8	Do you have white, scaly, itchy, hairless patches on your head	326 (79)	88 (21)			
9	Do you have discolored patches on your skin even though they are not itchy?	241 (58)	173 (42)			
10	Does anyone else in your class have similar skin disease condition?	343 (83)	71 (17)			
	<b>Mean</b>	291.8 (70.6%)	122.2 (29.4%)			

**TABLE 3:** Simple percentage of the extent of knowledge of primary school pupils about the causes, prevention and treatment of dermatophyte infection in Uyo metropolis.

S/N	Knowledge of primary school pupils about the causes, prevention and treatment of dermatophyte infection in Uyo metropolis			CA $\chi^2$	Df	Crit $\chi^2$
		Yes (%)	No (%)			
11	Ringworm of the head is caused by pouring sand on my head.	378 (91)	36 (9)	15.07	9	16.92
12	Ringworm is caused by sharing towels, combs, and hairbrushes with other people who have ringworm.	84 (20)	330 (80)			
13	If I bath regularly with clean water and soap I will not get ringworm Infection.	126 (30)	288 (70)			
14	Ringworm is caused by playing in the grass	244 (59)	170 (41)			
15	If I play with my classmate who is infected with ringworm I will not get ringworm infected also.	89 (22)	325 (78)			
16	I squeeze paw-paw leaf sap on the spot.	283 (68)	131 (32)			
17	I scrub the spot the guava leaves.	332 (80)	82 (20)			
18	I washed the spot, then rub antifungal cream on it.	38 (9)	376 (91)			
19	I used hot water and salt to treat it.	371 (90)	43 (10)			
20	I visit the doctor for diagnosis and treatment.	37 (9)	377 (91)			

<b>Mean</b>	198.2 (47.8%)	215.8 (52.2%)
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In response to research question four, “Do dermatophyte infection affect the academic performance of primary school pupils in Uyo metropolis?” Table 4 revealed the effects of dermatophyte infection on the academic performance of the pupils. It can be seen that 79% of the pupils claimed to lose their concentration during examination due to the intense itching and irritation from skin infection. Discomforts caused by the skin infection affected the academic performance of 91% of the pupils in the previous term. But 69%, of the pupils indicated that going for treatment in the morning did not make them to miss exam, 79% of them did

not doze off during examination, due to effects of drugs taken for treatment and 56% of them did not become forgetful during examinations due to (over) thinking or worrying about their skin disease. An average of 53.2% of the pupils gave the information that discomfort caused by their skin infections affected their academic performance in the previous term, while 46.8% maintained that their academic performances were not affected. The calculated Chi-square (CA  $\chi^2$ ) value of 25.76 was greater than the critical Chi-square (Crit  $\chi^2$ ) value at 9.49 at  $p < 0.05$  at 4 degrees of freedom.

**TABLE 4:** Simple percentage of the effect of dermatophyte infection on the academic performance of primary school pupils in Uyo metropolis.

S/N	Effects of dermatophyte infection on academic performance of primary school pupils			CA $\chi^2$	Df	Crit $\chi^2$
		Yes (%)	No (%)			
21	Intense itching from skin infection made me to lose concentration during examinations.	327 (79)	87 (21)			
22	Going for treatments in the morning before exams made me miss some morning examination.	129 (31)	285 (69)	25.76	4	9.49
23	Some drugs taken for treatment made me doze off during examinations	85 (21)	329 (79)			
24	Thinking / worrying about my skin disease made me forgetful during examination.	180 (44)	234 (56)			
25	Discomforts caused by my skin infection affected my academic performance last term.	378 (91)	36 (9)			
	<b>Mean</b>	219.8 (53.2%)	194.2 (46.8%)			

## DISCUSSION

The result of the analysis of the knowledge about dermatophyte infection among primary school pupils in Uyo metropolis revealed that there is little or no knowledge, considering the fact that 78% and 67% could not recognize the appearance of ringworm on the scalp or bare body respectively, also 81% of them considered bruises on their legs and arms as ringworm while 56% claimed that intense itchy patches between their toes oozing out water was not ringworm. An average of 38.41% of the pupils were able to identify the presence of dermatophyte infection on their bodies, while 61.59% could not. The calculated Chi-square ( $\chi^2$ ) value of 8.56 was less than the critical Chi square ( $\chi^2$ ) value of 9.49 at  $p < 0.05$  and at 4 degrees of freedom. With this result the null hypothesis was accepted. This implies that there is no significant knowledge about dermatophyte infections among primary school pupils in Uyo metropolis. This result is possible in view of the fact that most of the children in this age bracket have no enlightenment; they lack adequate knowledge of dermatophyte infection. This finding supports Popoola *et al.*, (2006) who observed that ringworm infection has neither been the focus of intensive study nor of active control programs in primary schools.

The result of the analysis of spread of dermatophyte infection among primary school pupils in Uyo metropolis revealed that the spread of dermatophyte infection among

these pupils was significant. Eighty-nine percent (89%) indicated having itchy patches on the head (*Tinea capitis*) while 58% indicated having discoloured patches on the body. This showed that majority of them already had the ringworm infection. Eighty-three percent (83%) of the pupils confirmed that other pupils also had the aforementioned symptoms of dermatophyte infections. On the average 70.6% of the pupils had dermatophyte infection, while 29.4% were free from the infection. The calculated Chi-square ( $\chi^2$ ) value of 26.88 was greater than the critical Chi-square ( $\chi^2$ ) value of 9.49 at  $p < 0.05$  alpha levels and at four degrees of freedom. With this result, the null hypothesis was rejected. This implies that there was significant spread of dermatophyte infection among primary school pupils in Uyo metropolis.

The finding supports Ogunbiyi *et al.* (2005), who observed that in the tropical and subtropical regions of the world like Nigeria where the warm and humid climates provide favorable environment for fungal infections, dermatological problems manifesting as primary and secondary cutaneous infections are prevalent. The findings also agree with Enemour and Amedu (2005), who noted that dermatophytosis is contagious in nature and can be transmitted through body contact especially in crowded settings or through inanimate objects. Children’s interaction

patterns may also increase the risk of acquiring the fungal infections through body contacts. The findings further lend credence to that of George and Altraide (2008), who reported that children between the age of 1 – 5 years had the highest frequency of dermatophyte infection (40.8%), followed by those between 5 and 10 years (36.7%).

The result of the analysis of the knowledge about causes, prevention and treatment of dermatophyte infection among primary school pupils in Uyo metropolis revealed that there is no significant knowledge about causes, prevention and treatment of dermatophyte infection. A total of 91% of the pupils believed that pouring sand on their head could cause ringworm. About 80% of them did not understand that sharing of combs, towels and hair brushes were possible means of contracting ringworm disease. Some of them (59%) believed that playing in the grass could cause ring worm and 78% did not know that ringworm is acquired through playing with infected classmates or playmates. It was only 30% of them that understood that improved personal hygiene which involves taking frequent bathe with clean water and soap can keep them from acquiring ringworm infections.

In the event of the presence of dermatophyte infection, many of them had different type of supposed treatment. Only 9% said they do visit the doctor for diagnosis, and probably this category of pupils learnt to wash the infected spot and rubbed antifungal cream as a form of treatment. Eighty percent (80%) of them said they would rub guava leaves on the spot, 68% of them said they would squeeze the sap of Papaya leaves on the spot while a greater number (90%) said they would use hot water and salt to treat it. This greater percentage (90%) indicated the overall lack of knowledge of the treatment of the infection and only 9% who do visit the doctor and used antifungal cream had the right knowledge. Only average of 47.8% of the pupils were able to state the causes, prevention and treatment of dermatophyte infection, while 52.2% could not state these. The calculated Chi-square ( $\chi^2$ ) value of 15.07 was less than the critical Chi-square ( $\chi^2$ ) value of 16.92 at  $p < 0.05$  levels and at 9 degrees of freedom. With this result the null hypothesis was accepted. This implies that there was no significant knowledge about causes, prevention and treatment of dermatophyte infection among primary school pupils in Uyo Metropolis. This result is possible in view of the fact that ringworm infection has neither been the focus of intensive study nor of active control programmes in the primary schools (Popula, et al., 2006). The neglect according to Omar (2003) is due to the fact that fungal disease of healthy humans tends to be relatively mild. Consequently, there is a paucity of information on the epidemiology of ringworm infection in primary schools in Uyo metropolis and this lack of scientific information has negatively affected the provision of adequate patient management, diagnosis, control programmes and antifungal drugs resistance surveillance among primary school children in Uyo metropolis.

The result of the analysis of the effect of dermatophyte infection on academic performance of primary school pupils

in Uyo metropolis revealed that there was a significant effect of dermatophyte infection on the pupils' academic performance. Although 79% of the pupils declared that drugs taken for treatment did not make them sleep off during lessons/examinations, 69% said that going for treatment in the morning before examination did not make them miss any morning examinations, and 56% were sure that thinking/worrying about their skin disease did not make them forgetful during their examination, 91% of them stated that discomforts caused by their skin infection affected their academic performance in the previous term. Up to 79% of the pupils said that intense itching due to skin infection made them lose concentration and focus during examinations. An average of 53.2% of the pupils gave the information that discomfort caused by their skin infections affected their academic performance in the previous term negatively, while 46.8% maintained that their academic performances were not affected. The calculated Chi-square ( $\chi^2$ ) value of 25.76 was greater than the critical Chi-square ( $\chi^2$ ) value of 9.49 at  $p < 0.05$  levels and at 4 degrees of freedom. With this result the null hypothesis was rejected. This implies that there was a significant effect of dermatophyte infection on academic performance of primary school pupils in Uyo metropolis. This finding validated a study by Koo et al. (2000) who observed that dermatophytoses inflict a lot of psychosocial traumas due to attached social stigma, ulceration and sometimes irritation which hampers pupils' attention in class. The finding also confirmed the work of Havlickova et al. (2008), who noted that dermatophytosis represents a significant public health problem and accounts for almost 20% of skin diseases affecting school children and especially those from poor socioeconomic background.

## CONCLUSION

There was no significant knowledge about dermatophyte infection among primary school pupils in Uyo metropolis. There was a significant spread of dermatophyte infection among primary school pupils in Uyo metropolis. There was no significant knowledge about the causes, prevention and treatment of dermatophyte infection among primary school pupils in Uyo metropolis. A significant effect of dermatophyte infection on academic performance was observed among primary school pupils in the Uyo metropolis.

Based on the findings, it was concluded that although there existed high prevalence of dermatophyte infection among primary school pupils, adequate knowledge and proper treatment/prevention was however low.

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