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RESEARCH ARTICLE

NEW TRENDS IN THE EPIDEMIOLOGY OF PEDICULOSIS IN URBAN PRIMARY SCHOOL CHILDREN OF THE NIGER DELTA AND SOUTH EAST NIGERIA

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ABSTRACT

This study assessed for the first time new trends in the epidemiology of Pediculosis in school children (age 5-14years) in the humid Niger Delta region and from the relatively drier environments of the south eastern states of Nigeria. Samplings covered 8230 pupils with more than 750 children interviewed and examined per selected school from nine cities of the two zones. Pupils from the two zones suffered pediculosis infection in 2012. Pediculosis cut across all ages sampled. Percentage infection was generally low;out of 1000 school children interviewed and examined in the Niger Delta zone, highest percentage infection of 4.7% was recorded in Bayelsa and the lowest was from Delta (2%). Data from the south-east were higher than what were collected from the Niger Delta zone. Results from the current survey show a new trend in Pediculosis infection in pupils of both zones; infection was higher in boys than girls in 2012. The overall assessment shows that only 195 girls (2.4%) had *Pediculushumanuscapitis* infection as against 372 boys (4.5%). Girls make use of salon facilities more than boys. Apart from poverty which was associated with pupils from low socioeconomic cadre other major factors that resulted in the new trends in the spread of the disease in the two ecological zones of Nigeria are discussed.

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INTRODUCTION

Pediculosis is a nation-wide public health concern; it affects children in many parts of the country, the tropics, sub-tropics and also in temperate countries. *Pediculus capitis* is a sucking louse and a parasite of humans that does not have a reservoir in domestic animals. Pediculosis has been associated with dirty lifestyles and poverty in the rural areas of Nigeria. In the rural communities and within the suburbs of most cities, especially in polygamous settings overcrowding is one of the primary risk factors for *Pediculushumanus capitis* infection. Children in such settings sleep about five on mats or on beds with head to head contacts. They share towels, combs, caps, cloths etc. and this is one of the reasons for the spread of the disease. In local barbing settings, the rampant use of same hair brush, combs and cover cloths widened the spread of the disease from person to person.

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Records are available on the incidence of Pediculosis from different parts of Africa Nutanson *et al*. (2008) also reported that in the *US pediculosis capitis* is the most prevalent parasitic infestation of children and that 6 to 12 million people are affected every year. *Pediculosis capitis* remains confined to the scalp. Locally, natives made a contribution on the control of the head louse by the application of palm nut oil and crude oil to children's scalps. Scalp pruritus is the cardinal symptom, although patients with lice can be asymptomatic. Pruritus with impetiginization should prompt the physician to look for lice or viable nits. Other authors Petrelli *et al.* 1980; Sinniah *et al*. 1983; Grainger *et al*. 1980; Ogunrinade *et al*. 1984; Kwaku-Kpikpi, 1982 and Scholdti *et al*. 1976 and Ebomoyi, 1988 also reported on some aspects of the biology, infection rate and epidemiology of *P. capitis* in humans. Infestation occurs most commonly in children, with a peak incidence between 5 to 11 years of age. The condition is more common in girls and less common in Black children. Direct head-to-head contact is the most common mode of transmission. Pruritus is the most common symptom of infestation. The gold standard for diagnosing *pediculosis capitis* is finding a live louse or nymph

in the scalp or viable egg in the scalp hair. Pediculicides are the most effective treatment. All household members and close contacts should be examined and treated concurrently if infested. The child should be allowed to return to school or to a child care facility after proper treatment. The child should be discouraged from close, direct head contact with others or from sharing items that have come in contact with the hair.

Pediculushumanuscapitis, is common in schoolchildren. It has been attributed to individual characteristics (*i.e.* gender, age group, hair type and length, race, etc.) and surrounding environmental (socio-economic) conditions, often with contradictory associations 7,19. The pathology associated with PC normally includes constant scalp pruritus which can occasionally result in excoriations and superinfections14. Moreover, head lice infestation is also associated with the detriment of health, both at individual familyand community levels (Heukelbach *et al*., 2003; Heukelbach and Feldmeier, 2004; Willems *et al*., 2004; Feldmeier *et al.*, 2009). *Pediculosis capitis* is a worldwide public health concern. Infestation occurs most commonly in children, with a peak incidence between 5 to 11 years of age. The condition is more common in girls and less common in Black children. Direct head-to-head contact is the most common mode of transmission both in urban and rural cases. Pruritus and scalp discomfort are the most common symptoms of *Pediculushumanus capitis* infestation. The establishment of nits and living lice on hair shafts and scalp is useful in diagnosing pediculosis. Earlier workers had recommended Pediculicides as the most effective treatment (Ogunrinade, 1984). All household members and close contacts should be examined and treated concurrently if infested. The child should be allowed to return to school or to a child care facility after proper treatment. The child should be discouraged from close, direct head contact with others or from sharing items that have come in contact with the hair. The current study was undertaken with the objective to determine the prevalence and distribution of *Pediculushumanus capitis* among urban primary school children in the two ecological zones of Nigeria and to identify factors involved in the spread. The present study would give an update on the epidemiology of the disease and help to provide relevant information on creating of awareness and campaign on regular visits to salons and use salon facilities to eradicate Pediculosis especially in urban Primary children.

MATERIALS AND METHODS

We adopted the methods of Ugbomoiko *et al.,* 2008 and examined the primary school children in the two ecological zones of Nigeria; Niger Delta and south-east zones. Three schools were chosen from each city and at least 1000 pupils were examined from the three schools per city except in places where the number of pupils was not up to the number we expected to examine. In the Niger Delta, we sampled from Rivers State (Port Harcourt), Bayelsa State (Yenagoa), Edo State(Benin), Delta State (Asaba), Abia State)Umuahia) and Imo State (Aba). We also examined pupils from the following States of South-East Zone namely; Anambra (Onitsha), Enugu State (Enugu) and Ebonyi State (Abakaliki). Each of the samplers made use of hand lenses to examine the scalp and hair shafts for nit, nymphs and adults of *P. capitis*

Data collection

Sampling was carried out by 50 samplers made of 10 health workers and forty Zoology students (graduates and undergraduates) of the Rivers State University of Science and Technology Port Harcourt, Nigeria who were trained on the epidemiology surveys in each zone covering 12 months of sampling (January 28th 2012-9th December 2012). This period covered dry season and rainy seasons of the year in the two ecological zones; Niger Delta and south-east zones. Samplings were carried out by 50 samplers made up of ten health officers and forty Zoology graduates of the Rivers State University of Science and Technology Port Harcourt, Nigeria who were trained on the epidemiology surveys. . Apart from recording the number of nit, nymphs and adults *P.capitis*, data were also collected from the individuals based on the followings:

Gender: Male/Female
Age:
School grade:
Visits to Saloon
Hair Treatments
Hair Cream
Sharing of accessories
Educational Background
Educated parents
Non Educated parents
Polygamy / Coupled Parents
Housing
Modern housing
Make shift housing
Plastered / Un-plastered Floor

RESULTS AND DISCUSSION

A total of 8230 pupils were interviewed and examined for pediculosis in the Niger Delta and south-east states of Nigeria. Out of this number 195 girls (2.4%) were infected as against 372 males (4.5%). *Pediculushumanuscapitis,* anectoparasite of man has a widespread distribution that transcends socioeconomic, religious, and racial groups (Ebomoyi, 2008).Urban School children of both Niger Delta and South-east had pediculosis infection. It affected children of all ages in primary schools and incidence was higher in boys than girls. Higher percentages of girls use hair cream than boys in most of the sampled children in all the States (Figs 3a and 3b). Oil or its components constitute good oviposition deterrents to most insects; the chemical compositions are pesticidal, fungicidal as well as bactericidal. Persons that make use of hair creams are not prone to pediculosis infection in addition to hair hygiene. Another source of pediculosis infection is through sharing of accessories. Our surveys showed that more boys shared accessories and wears. The practice and habits were not common in girls and the results showed another reason for higher infection in boys. Figs 4a and 4b showed lower percentage of infection in girls from pupils sampled. The role of polygamy was investigated (Fig. 5); children from rich polygamous background had low incidences as they did not share accessories, good accommodations but those pupils from poor polygamous homes had higher infections as they clustered to sleep on mats and mattresses and had head to head contacts.

Table 1. Prevalence of Pediculosis in Urban Primary School Children in Two Ecological Zones of Nigeria

Ecological

Zones……Females……....Males…….Total

Ecological zones	FEMALES No. Examined	No. with nits and Lice (%)	MALES No. Examined	No. with nits and Lice (%)	TOTAL No. Examined	TOTAL No. with nits and Lice(%)
(A).Niger Delta Zone						
Rivers (P.H)	1000	20(2.1)	1000	48 (4.8)	2000	68(3.4)
Bayelsa (Yenagoa)	980	25 (2.6)	980	67 (6.8)	1960	92 (4.7)
Edo (Benin)	800	18(2.9)	800	28 (6.6)	1600	46(2.9)
+Delta (Asaba)	1000	15 (1.5)	1000	23 (2.3)	2000	38(2.0)
Imo (Aba)	800	12(1.5)	800	56 (7.0)	1600	68(4.3)
Abia (Umuahia)	900	18(2.0)	900	42 (4.6)	1800	60(3.3)
(B.) South-East Zone						
Anambra (Onitsha)	1000	25 (2.5)	1000	38 (3.8)	2000	63(3.2)
Enugu (Enugu)	1000	28 (2.8)	1000	44 (4.4)	2000	72(3.6)
Ebonyi (Abakaliki)	750	30 (3.7)	750	26(3.4)	1500	56(3.7)
Total	8230	191(2.3)	8230	372 (4.5)	16460	563 (3.4)

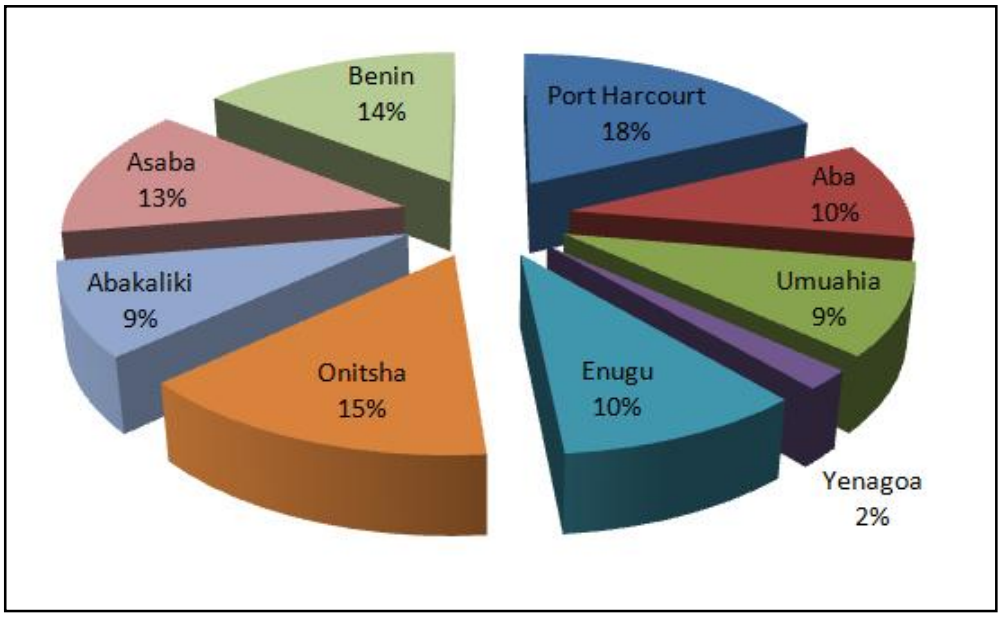

Fig. 1a. Girls Shampoo

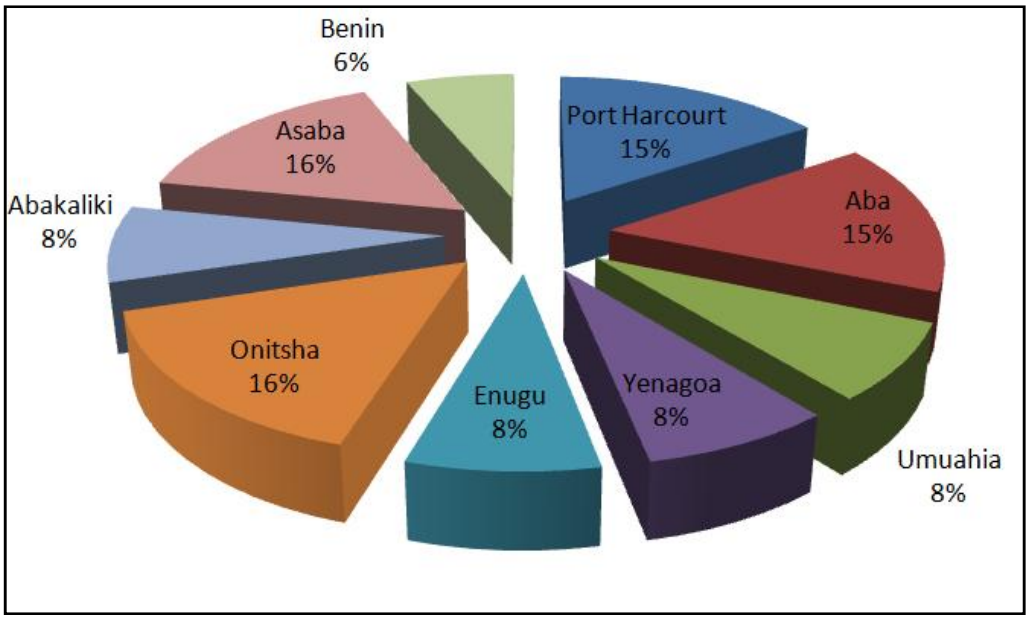

Fig. 1b. Boys Shampoo

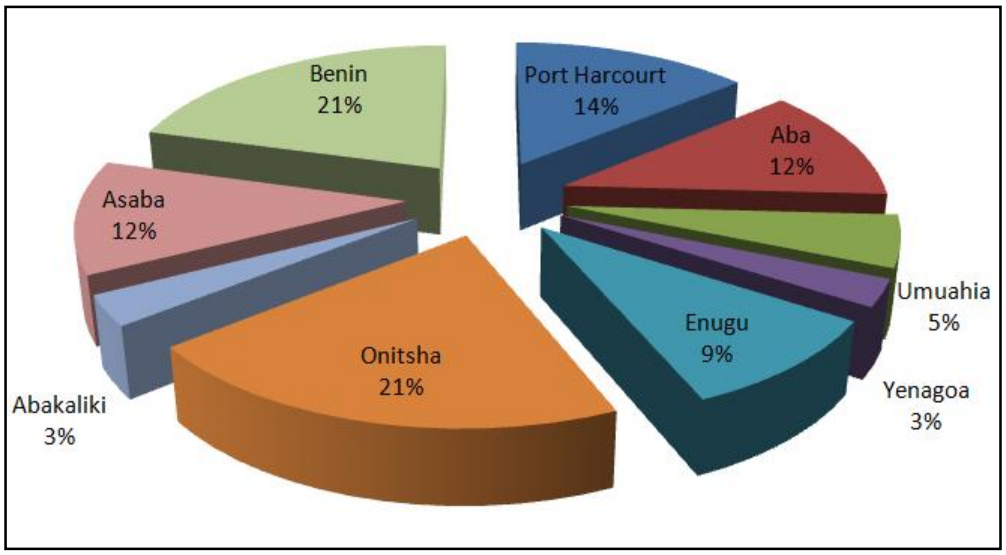

Fig. 2a. Girls Visit Saloon

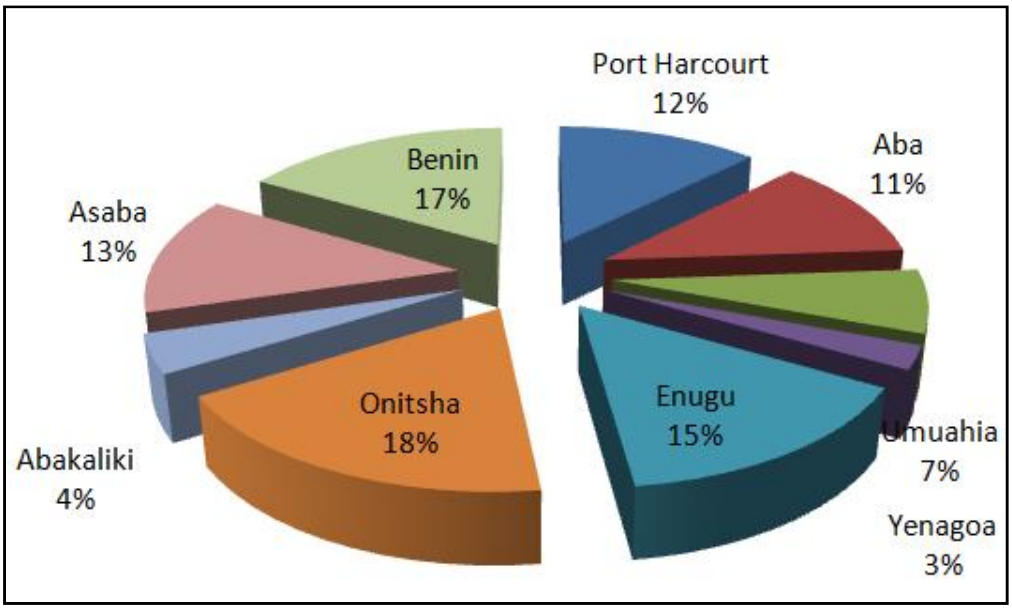

Fig. 2b. Boys Visit Saloon

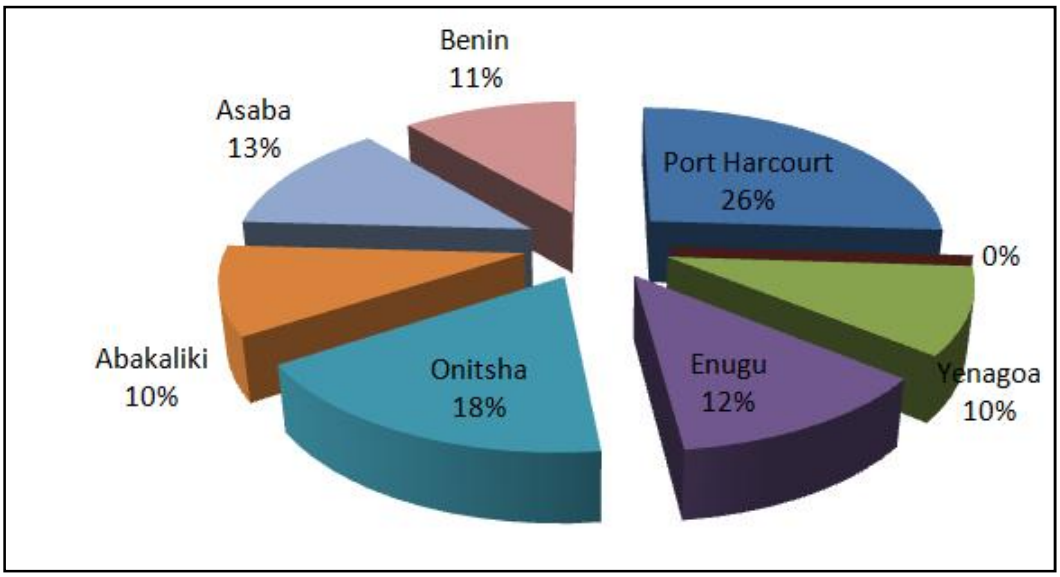

Fig. 3a. Girls Hair Cream

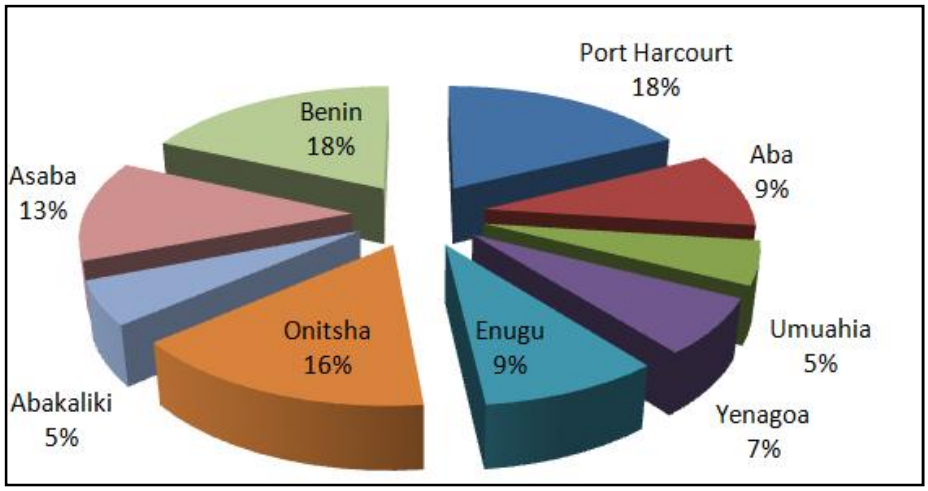

Fig. 3b. Boys Hair Cream

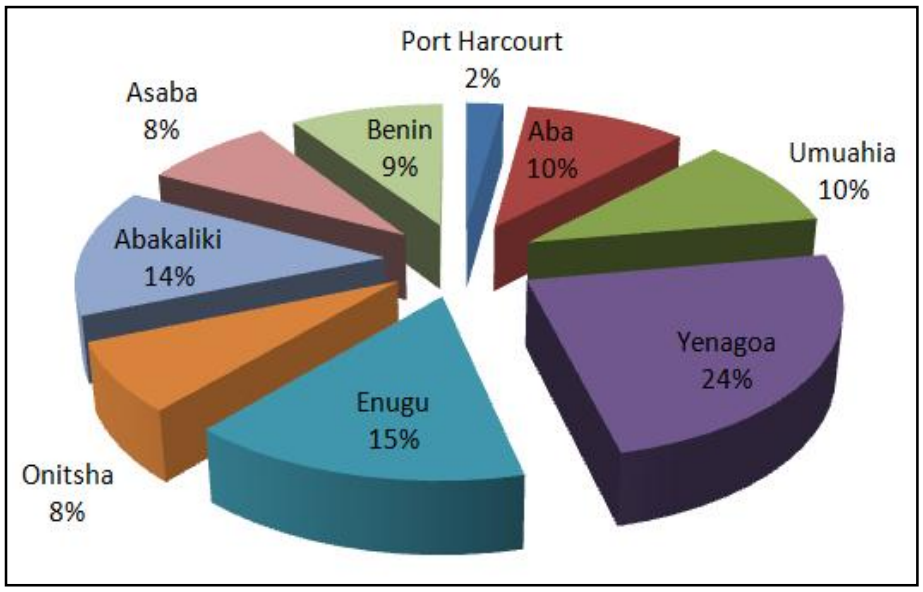

Fig. 4a.Girls Sharing Accessories

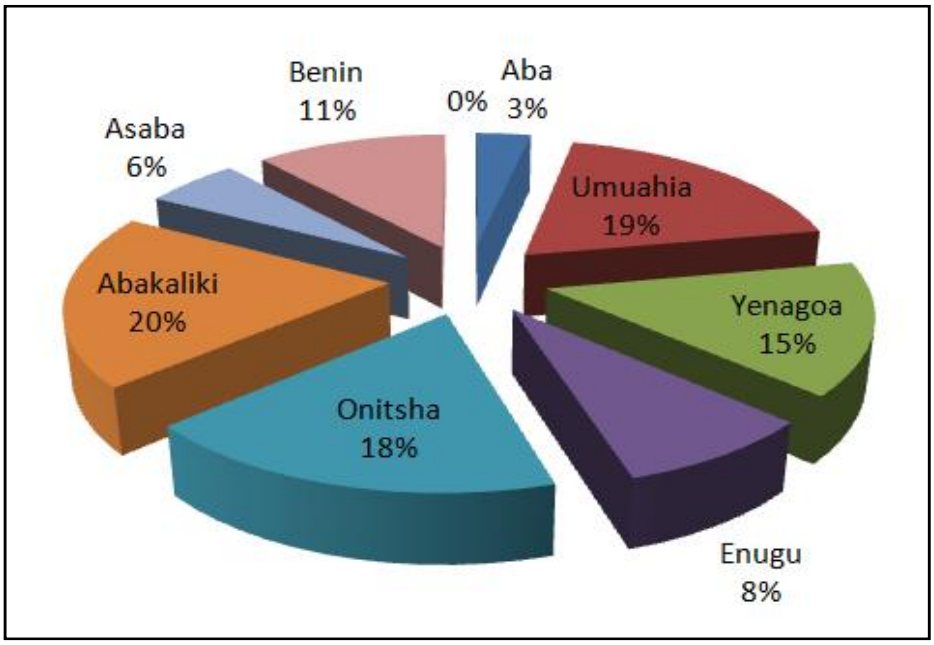

Fig. 4b. Boys Sharing Accessories

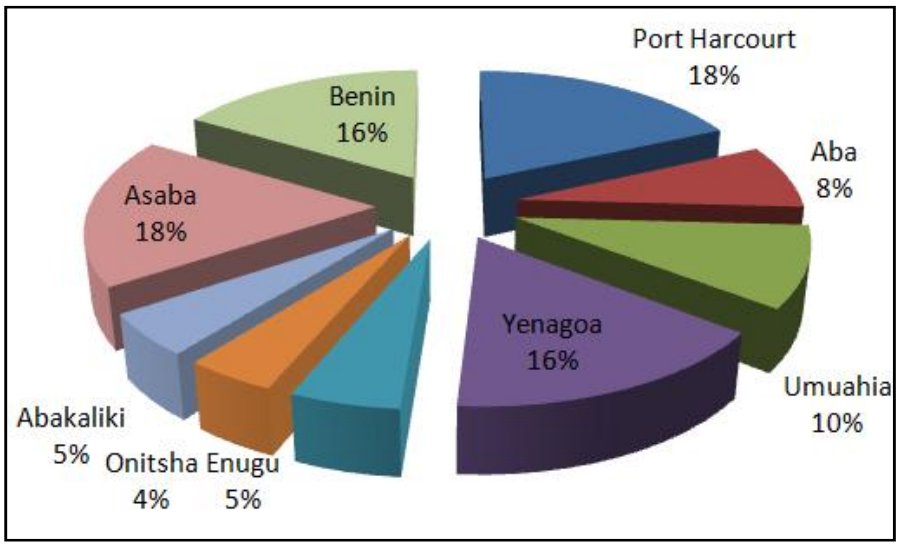

Fig. 5. Polygamy

Some of the pupils had artisans as parents who could only afford wooden- framed portable houses erected on mud that support crevices and cracks that enhanced breeding sites of *P. capitis* until hosts are located.

This update on the spread of pediculosis showed a deviation from most previous reports made earlier (Arene and Ukaulor, 1985) that infection rates were higher in girls than boys. In the eighties the awareness on the visit to salon and use of hair treatments by children were not there and there were fewer salons in many cities of Nigeria. Only the elite and the rich could afford to expose their children to hair salons for hair treatments. In recent times girls utilized salons more and they also avail themselves of the use of shampoo and hair care more than the boys. Generally both girls and boys from prominent city schools sampled showed interest in hair care, personal hygiene and use of salon facilities for periodic heat treatment of hair and use of hair products. Some old habits of tradition in communal sharing of wears, towels, hats scarves, combs, eye glasses, necklaces promoted the transfer of nits, nymphs and adults of head lice and the spread of pediculosis.

Pediculosis as a disease constitutes a serious public health concern.Researchers havereported that*Pediculus* species are the transmitters of the causative agents of typhus and relapsing fever (Jones, 1967; Buxton, 1983).The physical irritation caused by *Pediculus* species bites can interfere with the ability of youngsters to learn, be attentive and perform psychomotor activities. For a long time, a high proportion of school children have been detected to be a reservoir for head lice (Buxton, 1983). Among the boys and girls of low socioeconomic class, the rates of infestation by *Pediculus capitis* were11.2% and 28.4% respectively. According to Ebomoyi (2008), the categories of children in Ilorin infested with lice were from crowded homes. Otherinvestigators have argued that the process whereby such children either share the same bed or mats exposedthemto infestation by their siblings or partners with whom they shared the same bed. Our study in the two ecological zones of Nigeria shows that sharing of wears aggravated pediculosis infection.

Earlier workers reported on higher prevalence of pediculosis in girls than boys (Arene and Ukaulor, 1985; Negi *et al*., 2001; Ebomoyi, 2008). Infection was higher in children of the South-Eastern States than those of the Niger Delta States; children from Enugu significantly suffered higher infection than those from other States (Fig. 1). The higher temperature of the south-east promoted higher infections as the parasites tend to multiply under higher temperature. Oviposition, moulting and growth are common during higher temperatures. Children in Primary schools had higher prevalence than those in nursery sections. Apparently the age group (nursery children) is still under parental care and supervision more than the primary sets. The independent lifestyle of primary school children does not offer them the same care as the younger ones. Figs 2a and 2b show that higher percentage of girls use hair shampoo than boys; 15% of girls of urban primary school girlsin Port Harcourtutilized such provisions in the salons Figs. 3a and 3b). Insects are repelled by detergents and are known to die when in contact with fluids that contain synthetic or natural volatiles. The incidences of Pediculosis therefore were lower in the girls who washed their hair even more regularly with shampoos.

Percentage of boys that used hair cream was low in all cities sampled; less than 20%, with Abakiliki and Umuahia scoring 5% each. Application of cream will help in deterring oviposition by adult females of *P. capititis* as most insect ectoparasites tend to avoid oil surfaces for oviposition. Earlier reports of girls harbouring higher head lice than boys (Arene and Ukaulor, 1985) have been overtaken by recent technologies. In the eighties, there were fewer numbers of modern hair-dressing and barbing salons; in recent time, parents expose their children to salons for washing of hair and treatments. Hair length and the braiding of hair by females can be a risk factor for pediculosis infections. The braided hair is tied up in bunches with thin black thread beginning about 8mm from the scalp. The thread proceeds to the tip of the hair bunch. Braided hair often remains unwashed for up to 3 weeks or more, facilitating pediculosis infection especially in the village settings. Furthermore, in those earlier years of lack of awareness and hair care facilities as relaxers were expensive and therefore not available then or used only by the elites who

had the enlightenment. Treatment of hair was not popular and there were fewer hair dressing salons and most girls did not have access to them; they therefore resorted to the use of soaps to wash their hair at home even at irregular intervals. Ugbomoiko *et al*., 2013 attributed higher prevalence of pediculosis in girls to their playing together more than boys. From our surveys girls in the urban schools are less infected because they utilized facilities that minimized their exposure to lice irrespective of their head to head contact at home or play grounds. There are improved lifestyles, hygiene and knowledge in most families now than before. Girls in most urban schools are more careful and cautious in their general hygiene practices than boys. Only boys that continually shave their hair (i.e those that wear a skin-shave, without any hair) escape pediculosis infection.

Conclusion

The current trend in most schools in the two ecological zones surveyed in Nigeria on Pediculosis infection in urban schools is that it has been controlled due to the exposure of both boys and girls to modern facilities and usage of salons. Hair care and availability of hair products has improved hair hygiene and management.

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