KNOWLEDGE, ATTITUDE AND PRACTICE (KAP) OF SCHOOL TEACHERS ON MALARIA, HELMINTHIASIS AND ASSOCIATED RISK FACTORS IN PRIMARY SCHOOLS IN ONITSHA, ANAMBRA STATE, SOUTH-EASTERN NIGERIA

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ABSTRACT

Structured questionnaires were administered to 160 teachers from different Nursery and Primary Schools in GRA Onitsha, Nigeria to assess their knowledge, attitude and practices (KAP) on malaria, helminthiasis and associated risk factors in the schools' premises. Educational attainments of the teachers were Masters Degree (0.8 %), Bachelors Degree (39.2 %), Diploma Certificate (50.8 %), and Secondary School Certificate (9.2 %). There were more female (99.2 %) than males (0.8 %). A high percentage of the teachers (75.4 %) attributed malaria to eating too much oily food, hereditary (0.7 %), intense sunlight (2.1 %), drinking of dirty water (0.7 %), butter (3.5 %), and fried foods (1.4 %). On malaria prevention, about 64.2 % of teachers heard about insecticide treated net (ITN) but have never used it. Other preventive measures mentioned were use of clean environment (31.9 %), mosquito nets (20.2 %), and antimalarial drugs (12.3 %). KAP on helminthiasis indicated that some of teachers attributed worm infection to eating sugary foods (19.2 %), drinking dirty water (9.3 %), natural occurrence (1.3 %), eating with dirty hands (13.9 %), unwashed fruits and vegetables (10.6 %), unripe fruits (3.3 %), and over ripped fruits (2.0 %). About 48.33 % had seen worms in pupil's stool., while 37.5 % had de-wormed pupils; 53.3 % of them using Ketrax®. Teachers' perceived methods of preventing worm infection were avoidance of sugary foods (27.9 %), washing hands before eating (10.46 %), washing fruits and vegetables before consumption (26.2 %), and drinking clean water (10.46 %), while 22.1-30 % did not know how to prevent nor treat helminthiasis. Risk factors for parasitic infections observed in most of the schools included indiscriminate defecation, unhygienic lavatories, blocked drainages, container breeding habitats and open dumping of wastes. Health education for teachers in nursery and primary schools on transmission, prevention and treatment of malaria and helminthiasis is highly advocated.

Keywords: Malaria, Helminthiasis, Parasitic infections, Risk factors, Primary schools children, KAP,

INTRODUCTION

Nearly 13 million children die each year in developing countries and majority of the deaths are attributable to parasitic diseases (Tomkins and Watson, 1989). Malaria, caused by protozoan parasite of Genus *Plasmodium*, debilitates and kills more people than any other single infectious disease (Sherman, 1998) and continues to be a major public health burden in Nigeria, which has the largest population at risk of stable malaria in the world (de Savigny *et al.,* 2004). Each year, one fifth of the world's population is at risk of malaria, with over 300 million coming down with the illness, resulting to more than one million deaths, with a child somewhere in the globe dying every 30 seconds (UNICEF, 2004). In Nigeria, malaria is holoendemic with intense all year round transmission (Bruce-chwatt, 1983) more especially in the wet season, and with fifty percent of the population experiencing at least one episode of malaria each year (Coker *et al.*, 2001). Studies in several parts of Nigeria have demonstrated deficiencies in knowledge, attitude and practices (KAP) of malaria (Agomo *et al.*, 1999; Fawole and Onadeko, 2001). According to Service (1993), community perception of malaria had suffered major set backs mainly due to misconceptions and cultural barriers within the communities. In West Africa, the community awareness on the causes of malaria is generally very poor. For instance, the sun and groundnut consumption were believed to cause malaria in the Benin-Republic (Kombila, 1994) while excessive drinking, heat, fatigue, flies and unsafe water were some perceived causes in Ghana (Okyere,

1994). In some parts of southern Nigeria, excessive heat, over work, excessive sex, sunlight, certain foods and drinks, noise, heredity and witch-craft and other superstitions were thought to be responsible for malaria (Brieger *et al.*, 1997; Nebe *et al.*, 2002; Ozumba and Ozumba, 2004). Current global estimates indicate that Soil transmitted helminthiasis is among the most common of all parasitic infections (Stephenson, 1987). Intestinal helminthiasis is particularly common in school children and these children carry the heaviest burden of morbidity due to infection (Ozumba and Ikpeze, 2007) and may contribute significantly to transmission as reported by Bundy *et al.* (1990). Increasing evidence suggest that intestinal helminthiasis affects health, nutritional status and growth, cognitive performance and school attendance of school children (Stephenson, 1987; Pawlowski *et al.,* 1989; Stephenson *et al.,* 1989; Connolly and Kvalsvig, 1992; Eneanya and Anikwue, 2006; Ozumba and Ikpeze, 2007). There is a dearth of information on KAP of nursery and primary school teachers on malaria, helminthiasis and associated risk factors in Onitsha. The need to improve on KAP of nursery and primary school teachers on malaria, helminthiasis and associated risk factors which will help in the control of parasitic infection among pupils stimulated the present study in nursery and primary school at Onitsha.

MATERIALS AND METHODS

The Study Location: The study was conducted between January and June, 2009, using Nursery and Primary Schools in GRA Onitsha (Latitude 6˚ 08' N and Longitude 6˚ 48' E), southeastern Nigeria.

Data Collection: Copies of a well-structured questionnaire were administered to 160 nursery and primary schools teachers who were requested to respond to questions regarding their KAP on malaria, helminthiasis among their pupils and the associated risk factors in their schools. Only 120 teachers responded and returned the completed questionnaire. Data on the questionnaires were collated and further corroborated with oral interviews and on-the-spot photographs of risk factors for parasitic infections observed in various schools inspected during the study period.

RESULTS AND DISCUSSION

Gender and educational attainment of the respondents are shown in Table 1. There was only one male teacher, which indicated that primary school teaching is being dominated by females.

Table 1: Gender and educational attainment of teachers in nursery and primary schools in Onitsha, Anambra State, Nigeria

Teachers	Number	Percentage
Gender		
Male	1	0.8
Female	119	99.2
Total	**120**	**100**
Educational attainment		
Masters degree (M.Ed)	1	0.8
Bachelor's degree (B.Sc, B.Ed, B.Tech)	47	39.2
Diploma certificate (NCE, HND)	61	50.8
Secondary school education (TCII, WASC)	11	9.2
Total	**120**	**100**

This observation may not be surprising. Onitsha is a commercial city where the get-rich-quick syndrome had gone into the heads of many males, hence teaching is not considered a lucrative vocation for men in the town (Ikpeze and Eneasator, 2008; Ikpeze, 2008). About 50.8 % of the teachers possess NCE and HND certificates, while 39.2 % have bachelor's degrees in Teaching and Technical subjects. Less than 10 % have Teachers Grade Two Certificate and the West African School Certificate, but only one person has a Masters degree in Education.

Despite their educational qualifications, it appeared that majority of the teachers have poor KAP on parasitic infections. KAP of teachers on causes and signs of malaria (Table 2) shows that about 75.4 % of the teachers perceived that eating of too much palm oil in foods was a major cause of malaria. It was surprising to note that only 7.1 % associated malaria with dirty environment, while 1.4 % mentioned stagnant water. Only 1 teacher (0.7 %) thought that mosquito bite could cause malaria. Nevertheless, most of the respondents possessed good knowledge of the signs of malaria. Responses, perhaps from personal experiences, ranged from fever and high temperature (26 %), head ache (22.8 %), body weakness (16.9 %), loss of appetite (10.9 %), cold (6.2 %) and vomiting (5.3 %).

About 31.9 % agreed that clean environment could prevent malaria. Other responses were installation of fly-proof window and door nets (20.2 %), taking anti-malaria drugs (12.3 %) and sleeping under insecticide treated bed nets (10.4 %). It is also observed that about 45.3 % of the respondents practice self-medication when they think they have malaria. This practice may be responsible for development of drug resistance, which is a problem in the control of malaria in Nigeria and other

Table 2: KAP for causes and signs of malaria amongst teachers sampled from nursery and primary schools in Onitsha, Anambra State, Nigeria

Knowledge, attitude and practice (KAP)	Number	Percentage
Causes of Malaria?		
Hereditary	1	0.7
Mosquito bite	1	0.7
Drinking dirty water	1	0.7
Eating too much of palm oil in food	107	75.4
Butter	5	3.5
Dirty environment	10	7.1
Fever	4	2.8
Poor feeding	6	4.2
Stagnant water	2	1.4
Fried food	2	1.4
Hot sun	3	2.1
Total	**142**	**100**
Signs of malaria?		
Body weakness	57	16.9
Hotness of the body	7	2.1
Head ache	77	22.8
Stomach ache	5	1.5
Fever (high temperature)	88	26
Yellowish eye	1	0.3
Joint pain	7	2.1
Yellowish urine	2	0.6
Loss of appetite	37	10.9
Vomiting	18	5.3
Body pain	6	1.8
Cold	21	6.2
Bitterness in the mouth	1	0.3
Weakness of the eyes	6	1.8
Oil on the face after sleep	1	0.3
Shivering	3	0.8
Reddish eye	1	0.3
Total	**338**	**100**

endemic areas of the world where self-medication is in vogue. However, about 25 % would opt to see a medical doctor, while 10.1 % would rely on herbs. Some of the teachers who use herbs declared their loss of confidence in proprietary malaria drugs, some of which are feared to be expired, faked or adulterated. The Onitsha bridge head drug market is reputed to be the largest in Black Africa, and the drug traders there are suspected to be engaged in fraudulent activities. Thus one becomes wary of any drug, especially malaria drugs, sold in the town. It is most alarming that a few persons (0.7 %) could erroneously think that immunization could protect people from malaria, others (10.1 %) had no idea whatsoever on the treatment of malaria. This poor perception may account for high morbidity and mortality seen in cases of non-complicated falciparum malaria in most communities in this country.

Table 3: KAP for prevention and treatment of malaria amongst teachers sampled from nursery and primary schools in Onitsha, Anambra State, Nigeria

Knowledge, attitude and practice (KAP)	Number	Percentage
Prevention of malaria?		
Fly-proof net on windows and doors	33	20.2
Clean environment	52	31.9
Early laboratory diagnosis	5	3.1
Spraying of insecticides	1	0.6
Taking anti-malaria drugs	20	12.3
Sleeping under insecticide treated net	17	10.4
Avoiding oily food	5	3.1
Drinking clean water	30	18.4
Total	**163**	**100**
Treatment of malaria?		
Taking malaria drugs (self-medication)	67	45.3
Avoid fried food	1	0.7
Using herbs	15	10.1
Seeing a medical doctor	37	25.0
Seeing a chemist	5	3.4
Immunization	1	0.7
Taking lots of fruits	2	1.3
Reduce eating of oily food	5	3.4
No idea	15	10.1
Total	**148**	**100**

Table 4 is the result of KAP for worm infection amongst teachers in nursery and primary schools sampled at Onitsha during the study period.

About 19.2 % of the teachers attributed worm infections to eating sugary things, 1.3 % to nature, where 27.2 % did not know any cause of worm infection. Other causes mentioned included drinking of dirty water (9.3 %), eating with dirty hands (13.9 %), unwashed fruits and vegetables (10.6 %), un-ripped fruit (3.3 %), over ripped fruit (2.0 %), dirty and spoilt food (2.6 %), worm infected food (2.6 %), and improperly cooked food and vegetables (8.0 %). Signs of worm perceived by the respondents included stomach pains and troubles (32.3 %), vomiting (27.2 %), and loss of appetite (4.6 %), while 12.9 % have no idea. On the reason for development of pot-belly amongst the pupils, 51.6 % that have noticed some pupils with pot belly had no idea of the cause, but others attributed pot-belly to worm infection (25.4 %), nature (2.4 %), sickle cell (3.9 %), malnutrition (4.8 %), over eating (1.6 %), stomach pain (1.6 %), other illnesses (3.9 %), cold food (0.8 %), anaemia (1.6 %), Kwashiorkor (0.8 %), and constipation (1.6 %). About 22.1 % of the teachers did not know how to prevent worm infection, 27.9 % suggested avoiding sugary foods.

Table 4: KAP for worm infection amongst teachers in nursery and primary schools sampled at Onitsha, Anambra State, Nigeria

Knowledge, attitude and practice (KAP)	*Number*	*Percentage*
Causes of worm infection?		
Eating of sugary foods	29	19.2
Drinking of dirty water	14	9.3
Eating of dirty and spoilt food	4	2.6
Eating of worm-infected food	4	2.6
Eating with dirty hands	21	13.9
Eating of unwashed fruits and vegetables	16	10.6
Eating of un-ripped fruits	5	3.3
Eating of over-ripped fruit	3	2.0
Natural (worm infections come and go)	2	1.3
Eating of improperly cooked food and vegetables	12	8.0
No idea	41	27.2
Total	**151**	**100**
Signs of worm infection?		
Stomach pain and trouble	70	32.3
Spitting of saliva	5	2.3
Vomiting	59	27.2
Loss of appetite	10	4.6
Anaemia	2	0.9
Noisy stomach	7	3.2
Blood in urine	1	0.5
Frequent watery stool	6	2.8
Blood in stool	2	0.9
Swollen tummy	10	4.6
Loss of weight	4	1.8
Headache	2	0.9
Fever	6	2.8
Weakness	4	1.8
Cold	1	0.5
No idea	28	12.9
Total	**217**	**100**
Ever seen worms in pupils' stool	58	48.33
Never seen worms in pupils' stool	55	45.83
No idea	7	5.83
Total	**120**	**99.99**
Do you de-worm your pupils?		
Yes	45	37.5
No	75	62.5
Total	**120**	**100**
With what do you de-worm your pupils?		
Ketrax	24	53.3
Combantrin®	21	46.7
Total	**45**	**100**
Prevention of worm infection?		
Washing hands before eating	18	10.46
Avoid eating of sugary things	48	27.9
Washing fruits and vegetable before consumption	45	26.2
Drinking clean water	18	10.46
Going to hospital for check-up	1	0.58
Cooking food well	3	1.7
Health Education	1	0.58
No idea	38	22.1
Total	**172**	**99.98**

Others methods of prevention pointed out by the teachers included washing of fruits and vegetables before consumption (26.2 %), drinking clean water (10.46 %), washing hands before eating (10.46 %), health education (0.58 %), cooking food well (1.7 %) and going to hospital for check-ups (0.58 %). About 37.5 % had previously dewormed their pupils with either Ketrax® or Combatrin®.

Figures 1 and 2 shows the photographs of some of the risk factors for parasitic infections observed in nursery and primary school premises and among the pupils under study at Onitsha. Figures 1A and B show the poor drainage system commonly seen in the schools. The PVC pipe discharges it waste into the shallow drainage gutter, the content of which has become stagnant and provide good breeding place for disease vectors, like mosquitoes. Pupils studying the illustrations on the adjacent wall are at risk of being bitten by these vectors. Pupils are equally exposed to the dirty surrounding provided by the stagnant drainage gutters. Indiscriminate voiding of faeces is common amongst the pupils (Figures 1C and D), thus encouraging the rapid breeding of flies that carry pathogenic bacteria and protozoa. Figure 1E shows that the used tyres delineating the play ground constitute very good habitats for container breeding *Aedes* and *Culex* mosquito species that transmit filariasis and other mosquito borne diseases. The play area (Figure 1 F) is already overgrown with weeds, which again, are excellent breeding grounds for arthropod pests. Pupils playing bare-footed (Figure 1G) are exposed to possible Geohelminth infections because faecal matter is thrown away on the area after washing the basins used by the pupils in defecating (Figure 1 C and D). Health risk posed by the refuse heap (Figure 1H) needs not be overemphasized. Apart from being unsightly, it is also a good breeding place for snakes scorpions, and rats which are proven transmitters of plague and other bacterial and Rickettsial infections in man.

Figure 2 also shows other risk factors noticed in course of the study.

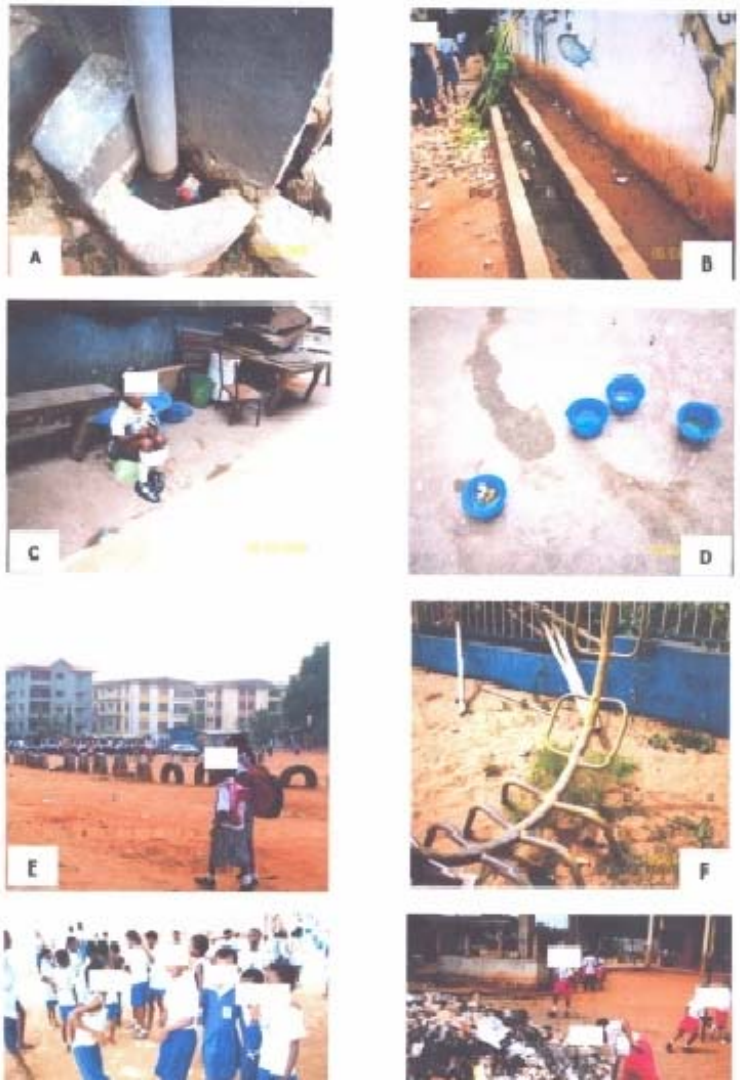

Figure 1: Risk factors associated with parasitic infection as observed in the study population (A to H are explained in the text)

Figures 2 A, B, C, D and E show that indiscriminate defecation and urination is very common in nursery and primary schools. Figure 2 A and B show pupils defecating in the faecal receptacles without supervision. The faecal receptacles were left uncovered afterwards, attracting flies. The floor of the open area used as toilet room is filled with excreta and urine. Myiasis causing flies visiting these sites might also perch on the pupils to lay eggs leading to myiasis. Pupils were observed to be putting on shoes while on bed during siesta. This action can carry the eggs of *Ascaris lumbricoides* to bed; and these eggs have been reported to be inhaled (Paniker, 1997). The water closets (WC) in most of the schools studied were without covers and non-functional., while excreta were left to accumulate and not flushed, thereby posing health risk to pupils of the schools. Figures 2C and D are typical examples where flies had already infested the toilet buckets and the seats. Pupils left to ease themselves without supervision contribute a lot in contaminating the toilet areas (Figures E and F). A child passing excreta in this toilet can easily pick up excreta and other things left on the seats by the fly, which include cysts of *Entaemoeba histolytica* that cause Amoebiasis, *Ascaris lumbricoides* eggs that cause Ascariasis, and possibly segments of tapeworms that may give rise to bladder-worms in the muscles of the pupils if ingested.

Most times pupils wash hands collectively (Figure 2D) due to lack of domestic water, which is a serious problem in the schools since the State Water Corporation, has been out of operation for more than nine years. This basin containing water is exposed to houseflies, which are mechanical vectors of diseases. They can carry pathogen like *Vibrio cholera*, which causes cholera, cysts of *Entamoeba histolytica,* which causes Amoebiasis several enteric parasitic diseases (Greenberg, 1971). At the end of school, pupils, perhaps with dirty hands, would eat snacks (Figure 2H) on their way home and may in this way contract parasitic infections, like Giardiasis caused by *Giardia lamblia*.

Conclusion: This work has exposed the level of KAP of teachers of nursery and primary school pupils on malaria, helminthiasis, and risks factors associated with parasitic infections in nursery and primary schools in Onitsha, some aspects of which are not very encouraging. Similar conditions may exist in other parts of the country, so appropriate health education on prevalent parasitic infections in the country is advocated for all categories of teachers in the primary and secondary levels of education in the country.

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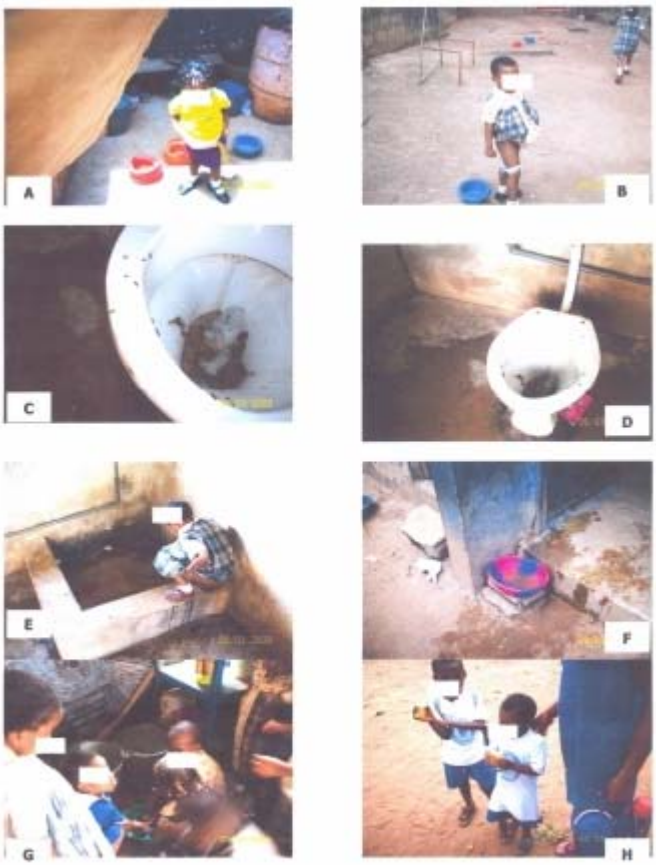

Figure 2: Other risk factors associated with parasitic infection as observed in the study population (A to H are explained in the text)

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