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AWARENESS AND EFFECTS OF SOCIO-ECONOMIC FACTORS ON THE PREVALENCE LEVEL OF URINARY SCHISTOMIASIS AMONG SCHOOL AGE CHILDREN IN SOME PARTS OF IMO STATE, NIGERIA

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ABSTRACT
A study to determine the awareness and effects of socio-economic factors on the prevalence of Urinary Schistosomiasis among 2250 pupils from 45 Schools in some parts of Imo State, Nigeria was carried out. A questionnaire was issued to obtain information on sex, age, community, local government area, knowledge of signs and symptoms of Schistosomiasis, awareness of Schistosomiasis and its mode of transmission, level of parental occupation and education and source of domestic water. Out of 2550 pupils examined, 830(36.9%) were aware of the disease with Ikeduru and Nwangele Local Government Areas having highest level of awareness of 73.6% and 75.2%, respectively, while 1420(63.1%) were not aware of the infection with Okigwe Local Government recording highest level of 202(80.8%). Across the ages, there was significantly lesser percentage of children aware of the disease with 10-12years age group recording highest level of 44.3%. Result also revealed that there was significant difference in the awareness of Urinary Schistosomiasis among the sexes with males and females recording 46.2% and 27.9% levels, respectively. Furthermore, all age groups gave non incorrect response on the possible source of infection and significantly less percentage of pupils correctly identified infected water as the source of infection. Result further revealed that significantly greater percentage of males (17.6%) correctly identified the possible source of infection than females (11.5%). From the result also, while there was a progressive decrease in the percentage of children infected with advancement of the parent's education prevalence of infection was dependent on parents' occupations. Highest infection was among children of farmers and less among those of Civil Servants. Prevalence of the disease among the children is dependent on the source of water since those that principally use river/stream/lake were more infected with 69.7%. Since knowledge of Socio-cultural factors is an important guide to control interventions, public enlightenment to educate the populace on the aetiology of the disease, provision of health facilities, provision of pipe borne water and improved sanitary habits should be extended to the study area and neglected foci.

KEYWORDS: Awareness, Effects, Socio-economic factors, Urinary Schistosomiasis.

INTRODUCTION
Schistosomiasisis is the one of the neglected tropical diseases in Nigeria which continues inhabitants of rural and peri urban areas where there is inadequate sanitation and poverty (WHO, 2002). Over 600 million people worldwide rae exposed to the risk of infection. Urinary Schistosomiasisis is a chronic disease caused by digenetic trematode *Schistosoma haematobium.* It has been reported by researchers such as Hotez and Kamath (2009), that schistosomiasis is more prevalent in school age children, adolescents and young adults who also suffer from the highest morbidity and mortality. These groups including women are involved in washing of house hold utensils and fetching of water in the morning or evening, resulting to visit to water sites (Ekwunife, 2004). In addition to the above, there are socio-economic parameters that contribute to the prevalence of *Schistosoma haematobium* infection. While many areas of the world are yet unsampled, some have been sampled without making definite data available on socio-economic factors that have influence on the prevalence of schistosomiasis in such localities (Okanla *et al*. 2003). It is worthy of note according to Ekwunife (2004) that the socio-economic background of school children taking into consideration their parents or guardians occupation could also influence the infection rate of schistosomiasis in areas which it occurs. In view of the above, there is need according to Wilkins (1977) to study these aspects in endemic areas of the disease among school children because they provide convenient baseline data for the

whole population. The study is aimed at determining the occurrence of co-infection of Schistosomiasis and urinary tract infections (UTI's) in the study area.

METHODOLOGY

STUDY AREA

Imo State is one of the thirty-six states of the Federal Republic of Nigeria. It is specifically in South Eastern Nigeria. It lies between geographic co-ordinates of latitude $4^0$45' and $7^0$15' N and longitude of $6^0$50'E with an area of about 5,100sq km (Imo State Government, 2010). The state has a common boundary with Abia state on the East, Anambra state on the North, Rivers state on the South. (Fig.1).

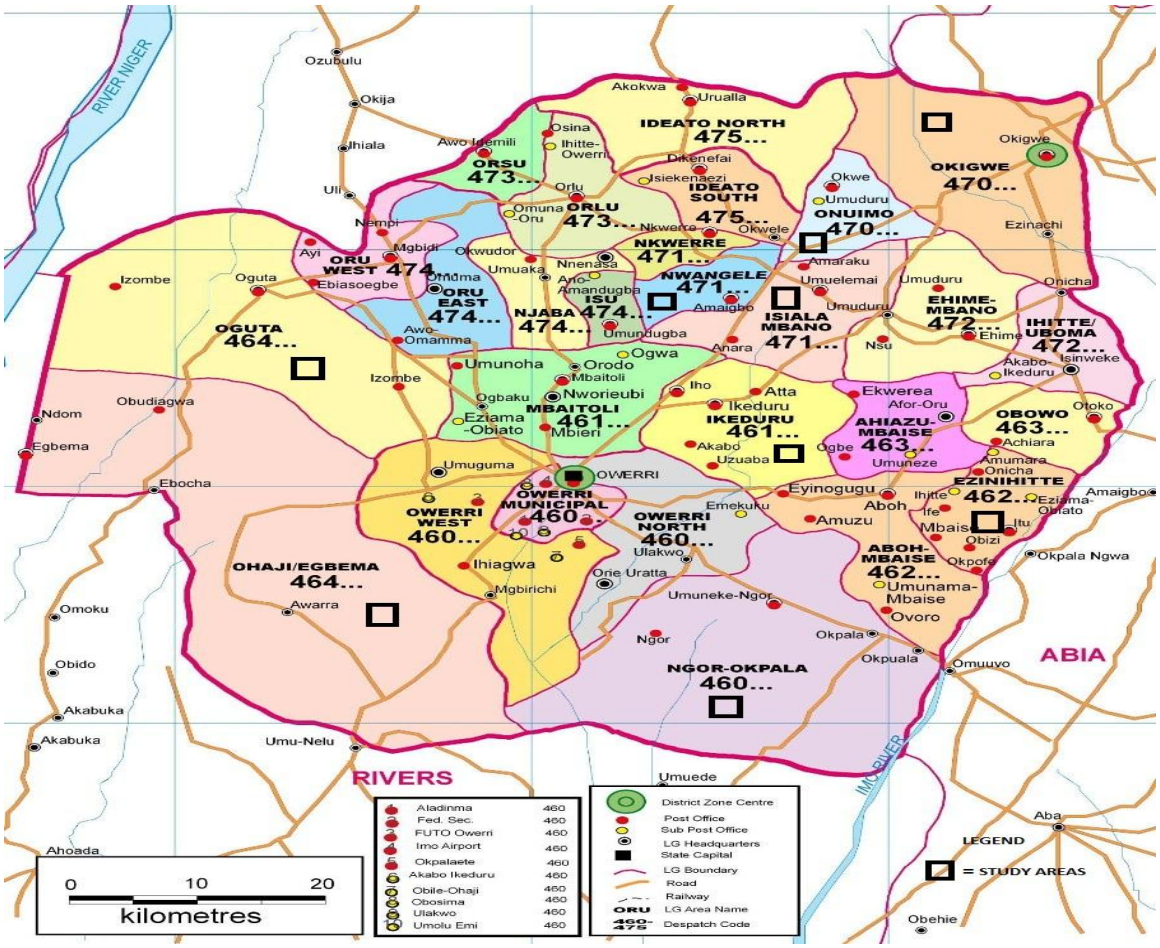

Fig 1: Map of Imo State Showing Study Areas.

SOURCE: IMSG, 2010

People of Imo State are mostly public and civil servants, some are into agriculture while a good number are petty traders and casual workers.

The State is divided into three zones, namely; Owerri zone, Orlu zone and Okigwe zone. Three Local Government Areas from each zone were selected for the study, namely; Oguta, Nwangele and Ohaji-Egbema Local Government Area were selected in Orlu zone. In Owerri zone, Ikeduru, Ngor-Okpala and Ezinihitte Local Government Area were selected. However in Okigwe zone, Isiala Mbano, Onuimo and Okigwe Local Government Areas were selected. In each Local Government, five schools located in five different autonomous communities were visited.

These Local Governments were considered based on the low level of social amenities e.g., portable water in such Local Government Areas. Additionally, level of agricultural and fishing activities and presence of either natural or man-made water bodies were also considered. Communities and villages in these Local Government Areas sampled were also selected based on their proximity to known endemic foci of the disease (Anosike *et al.* 2001*).*

STUDY POPULATION

Two thousand two hundred and fifty children between the age bracket of seven to fifteen years were examined for the study. Out of this number examined, two hundred and fifty children were examined from each Local Government Area and out of this number examined from each Local Government; fifty children were examined from each school located in each autonomous community visited.

ETHICAL APPROVAL AND INFORMED CONSENT

The study was approved by the Post Graduate Board of the Department of Animal and Environmental Biology Imo State University Owerri. With introduction letter from supervisors to State Ministry of Health and authority letters from the Ministry of Health and State Universal Basic Education Board to Local Government Health Units and subsequent authority letter from Local Government Health Units to Head Teacher of schools to be visited, a pre-survey visit was made to the study area using the approach of Hassan *et al.* (2012).

During the pre-survey visit, there was discussion with community heads, Traditional rulers, Local Government health centers, headmasters and teachers of different schools in the villages and communities of the Local Government Areas selected for the study. Additionally, villages and communities were educated on the significance of the study.

QUESTIONNAIRE ADMINISTRATION

A questionnaire containing questions relevant to urinary schistosomiasis was issued to each child examined. It was aimed at obtaining information on; sex, age, community, Local Government Area, name of school, Knowledge of signs and symptoms of schistosomiasis, awareness of schistosomiasis and its mode of transmission, levels of parental education and occupation.

Additional information on the risk factors where sought which includes; source of water for domestic use, such as well, pipe born water/mono pump, bore hole and river/stream/lake. Type of water contact activities such as swimming, fishing, washing, playing/bathing, collection of snail, fetching water, rice farming was also determined. Each questionnaire was accompanied by a corresponding urine specimen (Rine *et al*. 2013).

The questionnaire was administered with the help of trained field assistants. In all, there were thirty trained field assistants made up of teachers, volunteers from communities and undergraduate students. They were initially trained to enable them understand methods of sample and data collection, objective of the study, need to remain secretive.

During questionnaire administration, class teachers and trained field assistants mainly those from communities translated some of the questions and communicated to respondents from lower classes in the Local language for better understanding, while those in higher classes were directed to appropriately fill the form.

STATISTICAL ANALYSIS

Statistical analysis was done using chi square, correlation and simple percentage.

Table 3.1: Overall Awareness of Urinary Schistosomiasis Among School Age Children Examined.

Local Government Area	Total No. of Children examined	Yes (%)	No (%)	No (%) infected with S. haematobium
IsialaMbano	250	61(24.4)	189(75.6)	23 (9.2)
Onuimo	250	52(20.0)	198(79.2)	27(10.8)
Okigwe	250	48(19.2)	202(80.8)	32(12.8)
NgorOkpala	250	64(25.6)	186(74.4)	15(6.0)
Ikeduru	250	184(73.6)	66(26.4)	2(0.8)
EzinihitteMbaise	250	73(29.2)	177(70.8)	8(3.2)
Oguta	250	63(25.2)	187(74.8)	17(6.8)
Nwangele	250	188(75.2)	62(24.8)	2(0.8)
Ohaji Egbema	250	97(38.8)	153(51.2)	6(2.4)
Total	2250	830(36.9)	1420(63.1)	132(5.9)

Table 3.2: Age-Related Awareness of Urinary Schistosomiasis Among School age Children Examined.

Age group (years)	Total No. of children examined	Yes (%)	No (%)	No (%) infected with S. haematobium
7-9	528	148(28.0)	380(72.0)	18(3.4)
10-12	1002	448(44.3)	558(55.7)	73(7.3)
13-15	720	238(33.1)	482(66.9)	41(5.7)
Total	2250	830(36.9)	1420(63.1)	132(5.9)

Table 3.3: Sex-Related Awareness of Urinary Schistosomiasis Among School Age Children Examined.

Sex	Total No. of children examined	Yes (%)	No (%)	No (%) infected with S. haematobium
Male	1125	520(46.2)	605(53.8)	75(6.7)
Female	1125	310(27.6)	815(72.4)	57(5.1)
Total	2250	830(36.9)	1420(63.1)	132(5.9)

Table 3.4: Sex-Age Related Awareness Of Urinary Schistosomiasis Among School Age Children Examined.

Age group (years)	Male				Female				Total	
	No of children examined	Yes (%)	No (%)	No (%) of children infected	No of children examined	Yes (%)	No (%)	No (%) of children infected	Yes (%)	No (%)
7-9	300	88(29.3)	212(70.7)	11(3.7)	228	60(26.3)	168(73.7)	7(3.1)	148(17.8)	380(26.8)
10-12	506	229(45.3)	277(54.7)	40(7.9)	496	215(43.3)	281(56.7)	33(6.7)	444(53.5)	558(39.3)
13-15	319	230(63.6)	116(36.4)	24(7.5)	401	35(8.7)	366(91.3)	17(4.2)	238(28.7)	482(33.9)
Total	**1125**	**520(46.2)**	**605(53.8)**	**75(6.7)**	**1125**	**310(27.6)**	**815(72.4)**	**57(5.1)**	**830(36.9)**	**1420(63.1)**

Table 3.5: Overall Awareness Of Means Of Contacting Urinary Schistosomiasis Among School Age Children Examined.

L. G. A's	No. of Children Examined	No (%) Children Infected	Walking bare footed	Sexual relationship	Insect bite	Hereditary	Spiritual attack	Dirty environment	Direct contact with infected water	Sleeping without bed net	Playing with sand	No idea
IsialaMbano	250	23(9.2)	20(8.0)	35(14.0)	20(8.0)	25(10.0)	23(9.2)	20(8.0)	15(6.0)	17(6.8)	13(5.2)	52(20.8)
Onuimo	250	27(10.8)	28(11.2)	29(11.6)	28(11.2)	21(8.4)	28(11.2)	18(7.2)	12(4.8)	15(6.0)	10(4.0)	61(24.4)
Okigwe	250	32(12.8)	35(14.0)	20(8.0)	18(7.2)	10(4.0)	15(6.0)	22(8.8)	10(4.0)	30(12.0)	25(10.0)	65(26.0)
NgorOkpala	250	15(6.0)	4(1.6)	20(8.0)	27(10.8)	24(9.6)	33(13.2)	32(12.8)	22(8.8)	7(2.8)	7(2.8)	74(29.6)
Ikeduru	250	2(0.8)	10(4.0)	17(6.8)	2(0.8)	16(6.4)	3(1.2)	35(14.0)	53(21.2)	12(4.8)	0(0.0)	102(40.8)
EzinihitteMbaise	250	8(3.2)	15(6.0)	15(6.0)	14(5.6)	9(3.6)	21(8.4)	5(2.0)	66(26.4)	9(3.6)	11(4.4)	85(34.0)
Oguta	250	17(6.8)	2(0.8)	45(18.0)	28(11.2)	1(0.4)	10(4.0)	9(3.6)	32(12.8)	18(7.2)	14(5.6)	91(36.4)
Nwangele	250	2()0.8	40(16.0)	13(5.2)	11(4.4)	1(0.4)	3(1.2)	2(0.8)	59(23.6)	26(10.4)	5(2.0)	90(36.0)
OhajiEgbema	250	6(2.4)	16(6.4)	36(14.4)	5(2.0)	3(1.2)	2(0.8)	5(2.0)	63(25.2)	41(16.4)	2(0.8)	77(30.8)
Total	**2250**	**132(5.9)**	**170(7.6)**	**230(10.2)**	**163(7.2)**	**110(4.9)**	**138(6.1)**	**148(6.6)**	**332(14.8)**	**175(7.8)**	**87(3.9)**	697(31.0)

Table 3.6: Age-related awareness of means of contacting urinary schistosomiasis among school age children examined.

Age Group (Years)	No. of Children Examined	No (%) Children Infected	Walking bare footed	Sexual relationship	Insect bite	Hereditary	Spiritual attack	Dirty environment	Direct contact with infected water	Sleeping without bed net	Playing with sand	No idea
7-9	528	18(3.4)	51(9.7)	11(2.1)	101(19.1)	25(4.7)	13(2.5)	24(4.5)	63(11.9)	52(9.8)	37(7.0)	151(28.6)
10-12	1002	73(7.3)	60(6.0)	172(17.2)	4(0.4)	54(5.4)	31(3.1)	74(7.4)	129(12.9)	105(10.5)	34(3.4)	339(38.8)
13-15	720	41(5.1)	59(8.2)	47(6.5)	58(8.1)	31(4.3)	94(13.1)	50(6.9)	140(19.4)	18(2.5)	16(2.2)	207(23.8)
Total	2250	132(5.9)	170(7.6)	230(10.2)	163(7.2)	110(4.9)	138(6.1)	148(6.6)	332(14.8)	175(7.8)	87(3.9)	697(31.0)

Table 3.7: Sex-Related Awareness Of Means Of Contacting Urinary Schistosomiasis Among School Age Children Examined.

Sex	No. of Children Examined	No (%) Children Infected	Walking bare footed	Sexual relationship	Insect bite	Hereditary	Spiritual attack	Dirty environment	Direct contact with infected water	Sleeping without bed net	Playing with sand	No idea
Male	1125	75(6.7)	95(8.4)	99(8.8)	63(5.6)	31(2.8)	61(5.4)	78(6.9)	198(17.6)	101(9.0)	40(3.6)	359(31.9)
Female	1125	57(5.1)	75(6.7)	131(11.6)	100(8.9)	79(7.0)	77(6.8)	70(6.2)	134(11.9)	74(6.6)	47(4.2)	338(30.0)
Total	2250	132(5.9)	170(7.6)	230(10.2)	163(7.2)	110(4.9)	138(6.1)	148(6.6)	332(14.8)	175(7.8)	87(3.9)	697(31.0)

Table 3.8: Prevalence of Urinary Schistosomiasis In Relation To The Level of Parental Education of School Age Children Examined.

Level of education	Father			Mother			Total No (%) infected
	No examined	No (%) infected	No (%) uninfected	No examined	No (%) infected	No (%) uninfected	
No formal education	382	28(7.3)	354(92.7)	504	35(6.9)	469(93.1)	63(47.7)
Primary education	250	18(7.2)	232(92.8)	324	16(4.9)	308(95.1)	34(25.8)
Secondary education	223	10(4.5)	213(95.5)	283	14(4.9)	269(95.1)	24(18.2)
Post-Secondary education	149	6(4.0)	143(96.0)	135	5(3.7)	130(96.3)	11(8.3)
Total	1004	62(6.2)	942(93.8)	1246	70(5.6)	1176(94.4)	132(5.9)

Table 3.9: Effect of Parental Occupation on The Prevalence of Urinary Schistosomiasis Among School Age Children Examined.

Occupation	Father			Mother			Total No (%) infected
	No examined	No(%) Infected	No (%) uninfected	No examined	No(%) infected	No (%) uninfected	
Artisans	275	15(5.5)	260(94.5)	282	20(7.1)	262(92.9)	35(26.5)
Farmers	245	18(7.3)	227(92.7)	352	25(7.1)	327(92.9)	43(32.6)
Fishers	202	8(4.0)	194(96.0)	409	14(3.4)	395(96.6)	22(16.7)
Civil servants	160	5(3.1)	157(96.9)	148	7(4.7)	141(95.3)	12(9.1)
Traders	120	12(10.0)	108(90.0)	55	8(14.5)	47(85.5)	20(15.2)
Total	**1004**	**58(5.8)**	**946(94.2)**	**1246**	**74(5.9)**	**1172(94.1)**	**132(5.9)**

Table 3.10: Relationship Between Water Source And Prevalence Of S. Haematobium Among School Age Children In The Study Area.

Water Source	No of children involved	No(%) infected with S. haematobium
Well water	450 (20.0)	21(15.9)
Pipe borne water /mono pump	248 (11.0)	8(6.1)
Bole hole	352 (15.6)	11(8.3)
River/Stream/Lake	1200 (53.3)	92 (69.7)
Total	**2250**	**132 (5.9)**

DISCUSSION

Highest level of awareness occurred in Nwangele L.G.A. (75.2%) while Okigwe recorded the least (19.2%). This probably accounted for low level of infection in Nwangele L.G.A. and highest level of infection in Okigwe L.G.A, respectively. Results in Table 4.46 also revealed that local governments with high level of awareness had low level of infection while reverse are the case. This is then a pointer to the fact that awareness is important to the reduction if not total elimination of a disease such as urinary schistosomiasis. Results also showed that significantly more males (46.2%) were aware of urinary schistosomiasis than female (27.9%). High level awareness among males notwithstanding, higher level of infection was still recorded in males (6.7%) than females (5.1%). This could be to reserved lifestyle of the females in the study area. This trend of result could further be explained b y considering the fact that boys are very active. They engage in unbridle swimming, play/bathing, fishing etc more than females. This practice exposes the boys more to risk of infection, since level of exposure or contact with water containing carcariae of the parasite and the risk of infection are linearly related (Abdullahi *et al*. 2011). Across the ages, children within 10-12years recorded highest level (44.3%) awareness of urinary schistosomiasis but still recorded highest infection level of 7.3%. This is probably because they are more adventurous and involved more in water contact activities. This group is followed by those in 13-15years age bracket. These groups are more advanced with better improved habits. Awareness in those with 7-9years is the lowest and still they had lowest level of infection (3.4%). This could be attributed to their restricted life style, moreover majority are still under the control of their parents.

Statistical analysis revealed that infection does not depend on parents' level of education though children whose parents had no formal education recorded the highest infection (47.7%). This trend of result is in agreement with Houmson *et al*. (2012). Also the fact that educational backwardness has a great impact on the distribution of schistosomiasis in rural communities has been reported in Cross River State, Nigeria (Etim, 1995). This could be due to lack of proper knowledge of the disease which leads to inability to properly educate their children about the preventive measures against the disease. Children of parents with primary education had higher infection level of 25.8%, followed by those from parents with secondary education 18.2% while the east level of infection was observed from children whose parents had post secondary education. This trend could be attributed to the fact that the higher the level of education, more and properly the children are educated about the possible cause and factors that can lead to contamination of the disease.

Prevalence of urinary schistosomiasis was found to depend on parents with different occupation. Children from parents with different occupation recorded different prevalence levels, but higher infection rate was observed among children of farmers (32.6%) while least in children of civil servants. Highest prevalence of infection among the children of farmers is because these children often go to the farm with their parents and as such are unavoidably in contact with infected water due to the nature of their duty. Some of them are hired labourers in swampy rice fields. Their occupation predisposes them to infection (Anosike *et al*. 2002). The finding is in accord with that of Uwaezuoke *et al*., (2008) who observed in a study in Ebonyi State that children of farmers had the highest infection rate of 53.5% compared to children from parents of other occupational groups.

This finding however opposed Olusegun *et al*. (2011), who reported highest prevalence of 0.7% in children of artisans.

CONCLUSION

In conclusion, urinary schistomiasis is still a major public health problem and authorities concerned should tackle it. There is need for intervention by local government and concerned organization to set up measures in improving water supplies in these areas. Public health education on the associated risk factors and dangers posed by the disease.

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