

## Original Article

# Evaluation of the School Environment of Public and Private Schools in Enugu to Ensure Child Health Promotion

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ABSTRACT

**Objectives:** Poor maintenance of school environment can cause or worsen illnesses among schoolchildren. The objective of this study was to assess the healthfulness of school environments of primary schools in Enugu East, Nigeria, and to compare the difference if any between public and private schools. **Study Design:** This was a cross-sectional noninterventive study of the school environments in Enugu East, Nigeria. **Methods:** Multistage sampling method was used to select the sample population. The participating schools were inspected and their head teachers were interviewed using a questionnaire. Scores were awarded using the School Health Program Evaluation scale. **Results:** Thirty-three schools were studied. The most common source of water for most schools was well. Eleven schools dump refuse openly. Three public schools only had functional toilets. All public schools were adequately ventilated and lit. One private school had a foodservice area. Ten schools did not have a play field, while three public schools had soaps for handwashing. The mean scores for public and private schools were 33.00 and 37.86, respectively. Three schools only attained the minimum score of 57 of a maximum of 66. **Conclusion:** The environment of primary schools in Enugu east, Nigeria, is unhealthy and unfriendly and currently cannot promote and protect the health of the schoolchildren.

**KEYWORDS:** Child health, Nigeria, school environment

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## INTRODUCTION

Schools are the only institutions that can nearly reach all children and are in a unique position to improve the education and health status of children and young people.<sup>[1]</sup>

Healthful School Environment (HSE), a component of school health program (SHP), involves the safety and health of the entire school population.<sup>[2]</sup> The American Academy of Pediatrics defines a “HSE” as “one that protects students and staff against immediate injury or disease and promotes prevention activities and attitudes against known risk factors that might lead to future disease or disability.”<sup>[3]</sup> SHP ensures that schoolchildren are in optimal health at all times to attain their physical and intellectual potentials as well as receive moral benefits from their health providers and teachers.<sup>[4]</sup> In Nigeria, the school-aged child is the survivor of the

very high childhood mortality;<sup>[5,6]</sup> therefore, it becomes essential that the school contributes to his/her growth, development, and well-being.

HSE involves everything in the school surrounding that affect the physical, mental, and psychological well-being of the school population.

Poor school environment can cause or exaggerate illnesses among children and their teachers, resulting in higher rate of absenteeism, less time in classroom, and ultimately reduced academic achievement.<sup>[7]</sup> Children, therefore, deserve a safe and healthy environment in which to learn and grow. Benefits of a HSE can be

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seen in decreased absenteeism of both students and teachers,<sup>[8-10]</sup> stronger academic performance,<sup>[10-12]</sup> and higher scores on standardized tests.<sup>[13]</sup> Suboptimal indoor environment in school has a negative impact on students' performance and teachers' productivity.<sup>[10,11]</sup>

There is free primary and secondary education in Enugu, and this has resulted in a significant increase in enrolment.<sup>[14]</sup> There has also been a proliferation of schools in this area in the recent past, especially in private schools with many located in apparently unsafe environments such as uncompleted structures, nearness to highways and bushes, crowded with poor ventilation, and absence of conveniences exposing children and their teachers to health risks such as snake bites.

It becomes doubtful whether there are set minimum standards before licenses are issued to operators of such schools. These observations prompted the researchers to study school environments in this area as schools are capable of providing a good platform for improving child health in the state. The researchers also intend to find out if there is a difference between the environment of public schools and that of schools owned by private individuals.

## METHODS

### Ethical approval

The approval of Health Research and Ethics Committee of University of Nigeria Teaching Hospital and the school authorities was obtained before commencing the study.

### Participating Schools

This was a cross-sectional study of selected primary schools in Enugu East local government area (LGA) of Enugu state, Nigeria. This comprised of both public and private schools. The schools were located in the urban and rural part of the LGA.

### Study instrument

The SHP Evaluation scale was used to assess the schools. Assessment of SHP has been quantitative. The first SHP Evaluation scale was developed by Anderson and Cresswell<sup>[6]</sup> in the UK. This has been modified to suit the Nigerian environment and level of economic development.<sup>[2]</sup> The scale has also been validated for use in SHP evaluation in Nigeria.

### Procedure

Multistage sampling method was used to select schools that participated in the study. Enugu east LGA was divided into its 12 political wards. Four of the twelve wards did not have private schools and were subsequently excluded from the study. Thirty-three schools comprising 11 public and 22 private from the eight wards that had both public and private schools were studied.

The researchers visited the selected schools and inspected the environment – water supply, refuse disposal system, sewage disposal, school plan (walls, roofs, ventilation, lighting, furniture sitting comfort, food service, and nuisance), evidence of maintenance, and healthful living. Scores were awarded using the SHP Evaluation scale.

### Data analysis

This was done using Statistical Package for Sciences software (SSPS) (IBM, Chicago IL, USA) Version 20. The difference in the mean scores of HSE in private and public schools was compared using the Student's *t*-test. Level of significance was set at  $P < 0.05$  and confidence interval at 95%.

## RESULTS

The ages of the schools ranged between 1 and 57 years. There were 6471 pupils in the schools studied: 2659 in public and 3812 in private schools. The number of female children in the schools was 3422 while males was 3049. The schools had 247 teachers, 148 in the public and 99 in private schools. Two schools were located in rural farm settlements. The ages of the teachers ranged from 25 to 72 years while their qualification ranged from Teachers Certificate II to Master degree in Education.

### Design

#### Water supply

Twenty-eight schools, which include 6 public and all the 22 private schools, have access to some form of water supply, with some having more than one source. One public and five private schools have government pipe-borne water. Three private schools buy water from commercial vendors and store in a water tank. Twenty-two schools have wells (5 public and 17 private), while one public school uses surface water (stream). There was no borehole in any of the schools sampled. A private school had their water source <200 m from the school, while three public schools had their water source >200 m from the school. All the other schools had water in the school compound. The mean scores for public and private school were 3.36 and 5.55, respectively, out of a maximum of 7 ( $t = -2.65$ ,  $df = 31$ ,  $P = 0.01$ ).

#### Refuse disposal

One public school had an incinerator, 14 schools (8 public and 6 private) dump their refuse openly. Eighteen schools (2 public and 16 private) bag their refuse, which is then collected by Waste Management Authority for onward disposal by controlled tipping. The mean scores of a maximum of 4 for public and private schools were 1.45 and 2.59, respectively ( $t = -2.71$ ,  $df = 31$ ,  $P = 0.01$ ).

## Sewage disposal

Twenty-eight of the 33 schools (7 public and 21 private) have sewage disposal structures while five do not. Of the 28 schools, 25 (7 public and 18 private) have water cistern while three use pit (all private). Only three of the seven toilets in the public schools were functional. The mean scores (of a maximum of 3) for public and private school were 2.45 and 2.73, respectively ( $t = -1.54$ ,  $df = 31$ ,  $P = 0.13$ ).

One public school had a toilet: pupil ratio of 1:31–45, the other six public schools that had toilet facilities had a toilet: pupil ratio of 1: >90. Two private schools had a toilet: pupil ratio of 1: ≤30, nine schools had 1:31–45, four schools had 1:46–60, four schools had 1:61–90, and two schools had 1: >90. The mean for public schools was 1.19 of a maximum of 5 while that of private school was 2.69 ( $t = -2.63$ ,  $df = 31$ ,  $P = 0.02$ ).

## School plan

### Buildings

Sixteen (48.4%) schools (6 public and 10 private) had strong walls and good roof in the school building. Nine schools (3 public and 6 private) had their school buildings made of strong walls but with minor cracks. Three private schools had old walls and leaking roofs while two public schools and three private schools were dilapidated.

### Floor

Three public schools and 14 private schools had standard floor spaces per child while the floor spaces in the other schools sampled were not standard. All the schools had flat and nonglossy floor finishing except one private school whose floor was glossy (tiled). One public school and two private ones had worn-off and dusty floor. There were no schools with sandy floor.

### Ventilation

All the public schools were adequately ventilated whereas only 12 (48%) of the private schools were adequately ventilated. Ventilation was controllable (i.e., the extent of the ventilation can be determined by occupants of the room) in 7 public schools and 10 private schools.

### Lighting

All the public schools had good lighting while only 13 (52%) private schools were adequately lit. One public school and three private schools had supplementary artificial light.

### Insulation from heat

Seven public schools were properly ceiled; three were partially ceiled while one had no ceiling. Nine private schools were properly ceiled; three were partially ceiled while ten had no ceiling.

### Sitting comfort

The pupils were all seated in only four public schools and all the private schools. The teachers were all seated in all the schools. (The seats were self-provided in the public schools.)

### Food service area

Only one private school had a food service area.

### Safety patrol team

One public school and seven private schools had a safety patrol team.

### Fence

All but eight schools (one private and seven public) had school fences.

### Fire extinguisher

Six private schools had fire extinguisher while six schools (three of those that had fire extinguisher and another three private schools) had buckets of sand. There was no fire alarm system in any school.

### Fire protection

Two private schools were completely made of prefab materials while all the other schools were made of a combination of some prefabs and some fire-resistant materials.

### Nuisance/health hazard

There was an industrial population (mechanic and welding workshop) adjacent to a private school. Six schools (two private and four public) had animals within the compound, six public schools usually meet feces in the classrooms. There were neither open drainages nor incidences of flooding in any of the schools. Vectors/pests (sandflies, snakes, and rats) were occasionally a nuisance in six private schools and four public schools.

The mean scores for school plan for the public and private schools of a maximum of 35 were 19.09 and 19.45, respectively ( $t = -2.51$ ,  $df = 31$ ,  $P = 0.80$ ).

## Maintenance

### Evidence of maintenance

There were evidences of maintenance in 13 schools (1 public and 12 private). The mean score (of a maximum of 2) for public schools was 0.64 while private school was 1.45 ( $t = 2.34$ ,  $df = 31$ ,  $P = 0.03$ ).

## Healthful living

The emotional climate was adequate in all but five schools (one public and four private). It was also not compulsory to come to school with footwear in three schools (two public and one private). Ten schools did not have a sports field and all were private schools. Six schools had sports facilities (one public and five private).

Twenty-three schools had toilet rolls available and these were one public school and 22 private schools. Three public schools and 15 private schools had soaps available for handwashing. The same three public and 15 private schools had wash handbasins in their classes. Only one public school had drinking buckets and cups in the classes. Six public schools and 22 private schools had dustbin in their classes (made of empty cartons). The mean scores for public and private schools, out of a maximum of 10, were 5.98 and 6.95, respectively ( $t = -3.38$ ,  $df = 31$ ,  $P = 0.01$ ).

The mean for all the public schools out of a maximum of 66 was 33.00 while that of the private schools was 37.86 ( $P = 0.07$ ).

The mean score for both public and private schools was 34.55 of a minimum acceptable score of 57, at a test value of 57,  $P = 0.01$ .

## DISCUSSION

There is more concentration of children in the public schools than in the private ones. This is not unexpected as primary education is free in public schools in the State. Similarly, the average number of teachers in the public schools is more than that of private schools though it is not in tandem with the report from Mbaeri *et al.*<sup>[15]</sup> This is probably because government can afford to pay more teachers than private individuals. Despite the perennial scarcity of water in Enugu, 88% of the schools studied have a form of water supply (better in the private schools). This contrasts other studies done in other parts of South Nigeria<sup>[16,17]</sup> where water was found in 30% and 35% of schools, respectively, but similar to the finding of water in 88% of schools in Oredo by Mbaerie *et al.*<sup>[15]</sup> Water is essential for life and existence and is thus celebrated on March 22 every year. In schools, it is used for drinking, handwashing, and flushing toilets. It is the awareness of this that has made schools (67% in this study) resort to digging wells to have access to water. In addition, wells on the long term are a more cost-effective source of water for a school population, hence the preference by the schools. Government through the Ministry of Health has the obligation to inspect and monitor these wells to make sure that they are safe and sanitary. It is unacceptable for the distance of water from a school to be >200 m as it not only poses a distraction from academic work but also poses a risk for children who go in search of water during school hours or else, sanitation would be compromised. It is a welcome development that more than half of the schools (54.5%) bag their refuse for collection and onward disposal by the state waste management though this requires the school to pay a token to the government. The improved bagging

of waste (significantly better in the private schools) can be explained by the better awareness created by the state waste management authority on its advantage. This protects the school environment from flies, rodents, and reptiles and the children from accidents, cuts, and bruises, which are some of the risks associated with open dumping as practiced by 42.4% of the schools, mainly public. This finding is in contrast to those in previous studies in Oredo LGA<sup>[15]</sup> and in Bonny LGA<sup>[16]</sup> where open dumping was practiced in all the schools and in 84% of schools, respectively.

The presence of toilet facilities in 84.8% of the schools was similar to the finding in Ibadan, Southwest Nigeria,<sup>[17]</sup> and Obio-Akpor, South-South Nigeria,<sup>[18]</sup> while it contrasted that from Bonny<sup>[16]</sup> where only 25% of the schools had toilet facilities. This is probably because most of the schools were in the urban part of the city with limited space for alternative method of fecal disposal such as open defecation. Water cistern was the most common method of sewage disposal in most of the schools. Only three of the five public schools with toilet facilities were functional. None of these toilets were gender sensitive as expected of child-friendly schools. The absence of toilet facilities in any school leaves people with no choice but to resort to unsanitary disposal of human wastes, increasing the risk of pollution and epidemics. Only two private schools met the recommended toilet: pupil ratio of 1:30 and this puts more pressure on the few available toilets, increasing their chances of being unsanitary and being a source of disease outbreak. The toilets in the public schools were grossly inadequate for the number of pupils though the situation was significantly better in the private schools. This situation if left further compromises sanitation. Less than half of the schools (48%) had strong walls and good roof mainly due to poor maintenance of aging structures. These findings are similar to reports in other Nigerian schools.<sup>[15,16,18]</sup> Ventilation was adequate in all the public schools mainly because the structures were designed to be schools *ab initio*. The findings of either makeshift structures or residential houses being converted to school buildings may explain the poor and even uncontrollable ventilation in the private schools. This may also explain the good and not so good lighting of the classrooms seen in the public (100%) and private (59%) schools, respectively. In a previous country report (UNICEF),<sup>[19]</sup> light was a significant issue in schools in Ebonyi, Nigeria, as only one school was noted to have adequate lighting for students to work. Forty-eight percentage of the schools only were properly ceiled. Some of the unceiled ones were uncompleted structures, very old schools with poor maintenance programs. These unceiled classrooms become very hot during the hot weather, especially

when compounded with poor ventilation. Furthermore, the sound of rains on the unceiled roofs interferes with learning during the wet season. According to some reports,<sup>[20,21]</sup> 38% of Nigerian schools have no ceiling and such schools cannot to be said to be child friendly. Child Friendly School Initiative<sup>[19]</sup> was launched in Nigeria in 1999 by the UNICEF. A school is said to be child friendly when it is physically safe, emotionally secure, and psychologically enabling, friendly, and welcoming, attend to the health and safety needs of the children, and provides equal opportunities and democratic procedures for both boys and girls.<sup>[2,19]</sup>

Learning may not be optimal in 64% of the public schools where some children stand or sit on the floor during classes. The situation in the public schools may be due to the increased population density and poor maintenance of infrastructure as 75% of the schools were precolonial structures. This may also explain the finding that all the teachers in the public schools provided their own seats. This may reduce the motivation and commitment of the teachers to the welfare of the children.

Most of the schools (76%) do not have a safety patrol team. They felt it was unnecessary as majority (76%) of the schools had fences while an assigned class teacher monitors the children during breaks. The safety team present in the eight schools also inspect the school environment for possible physical hazards and monitor the children at play to reduce the risk of violence and bullying. Majority of the schools are not prepared for any fire outbreaks because of the perceived absent risk of fire outbreaks. Presence of feces in classrooms was the major hazard in 55% of the public schools and this was said to be due to lack of fences and lack of public conveniences. It is even made worse that children in the affected schools start their day in school by packing feces from their classes. This poses both a great health hazard and psychological trauma for the children. Snakes are occasionally seen in a few schools that have bushes around them, increasing the risk of envenomation for the children while at play. It was noted that as much as 46% of the private schools did not have sports field or play area similar to the report by Ndukwe in Lagos.<sup>[22]</sup> This is probably because the structures housing these schools were never designed to be schools and therefore lacked space for play. This lack of space in schools did not meet the recommendation of the implementation guidelines of the National SHP<sup>[23]</sup> of one hectare of land for a maximum of 500 learners. The absence of play area increases inactivity, worsening the rising prevalence of childhood obesity which has become a global concern. As ideally all children should attend school, the school has been identified as a key setting for promoting physical activity and the sports playfield

provides such arena. Children should have at least 60 minutes of moderate activity each day, with vigorous activity at least twice a week.<sup>[24]</sup>

## CONCLUSION

The school environment of primary schools in Enugu East, Nigeria, is unhealthy and unfriendly and there was no significant difference between the environment of public and the privately owned schools.

## Implication for school health

1. All schools should be made to bag their refuse before disposal
2. Aqua privy/pit latrines which are of low cost with little water requirement can be constructed by the schools without latrines
3. Schools without fences should have functional doors and windows that can be locked to prevent meeting feces in class
4. It should be made compulsory for every child to wear footwear to school.

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## Conflicts of interest

There are no conflicts of interest.

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