Original Research Article

A Comparative Study Of Personal Hygiene In Public And Private Schools In An Urban Local Government Area Of Rivers State

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Abstract

Background: Healthful school environment is one of the components of school health program that ensures that the school environment is maintained at a high standard to safeguard the health of the children and provide them with a practical example of healthy living. Hygiene practices and sanitary conditions differ among schools and play major roles in the transmission of communicable diseases within the community. The purpose of the study is to compare the level of knowledge and practice of personal hygiene of pupils of public and private schools in an urban Local Government Area of Rivers State, Nigeria.

Methods: This comparative cross-sectional study was conducted in four public and private primary schools in Port Harcourt LGA, Rivers State. The sample size was calculated and 139 pupils were randomly selected, 75 in the public and 64 in the private schools. Data collection was done with the use of interviewer-administered questionnaire. Data was analysed using SPSS Version 16. Differences in means were compared using Student's t-test while association

between categorical variables were examined with Chi-Square (X2) test. A probability value ≤0.05 was considered statistically significant.

Results: Public and private school pupils had very good hygiene knowledge (X2=0.101; p=0.97). Assessment of the personal hygiene revealed that the proportion of pupils who were rated as 'very clean' was higher in the private schools than the public schools, although not statistically significant (X2=2.881; p=0.277). There were significant differences in favour of the private schools in the cleanliness of the nails, body (skin) and mouth/teeth with p-values of 0.027, 0.003 and 0.003 respectively.

Conclusions: Pupils in public and private schools have a very high level of hygiene knowledge but low hygiene practice. This could indicate that additional health personnel are needed in Nigeria and other poor nations to care for the health of schoolchildren.

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Introduction

A school health program is an integrated set of planned strategies that promote students' optimal physical, emotional, social, and educational development [1]. The program involves the families and is determined by the local community, based on community needs, resources, standards, and requirements. It is coordinated by a multidisciplinary team accountable to the community for

program quality and effectiveness and consists of the following essential components: healthful school environment, school feeding services, skilled-based health education, school health services, and school, home, and community relationships [2]. In Africa, school health has been dubbed the "neglected component of primary health care [3]." Globally, barriers faced by school health programs include impaired vision and strategic planning; inadequate understanding and acceptance of school health programs; inadequate collaboration and coordination among responsible parties; lack of sense of ownership, responsibility, and accountability for actions to improve school health program; lack of resources (financial, human, material resources and organizational infrastructures) [4]. In almost every nation, school health programs are hindered by scarce resources, time, qualified professionals, public and political will [5]. In Nigeria, the educational sector's primary challenge has been poor infrastructure and overcrowded classrooms with teachers, pupils' ratio being 1:50 in most regions [6]. These affect the child's health, even when health is critical in school entry [7]. Schools' safe sanitation and hygienic practices are paramount to enhancing public health and are indispensable to optimal education outputs [8]. Diarrhoeal diseases, the second most common global illness affecting young children and a significant cause of death in lower-income countries, are closely linked with poor sanitation, poor hygiene, and lack of access to safe and sufficient water and food supplies [9]. The centrality of sanitation and water and hygiene to health has been made clear in numerous international declarations, but sadly this has not translated into progress on the

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ground [10]. The high prevalence of diarrhea and other infectious diseases among children of school age is due to the poor knowledge and practice of personal and environmental hygiene [11]. Most diseases, including diarrhea, cholera, and typhoid, can easily be prevented with cheap and proven interventions, such as pit latrines and handwashing with soap [12].

According to the study done in Edo State, the proportion of schools that had no toilet was 26% for private schools and 34.5% for public schools, and the proportion of handwashing facilities available for both private and public schools were 28.8% and 13.8%, respectively [13]. Improved hygiene practices are essential if transmission routes for water and sanitation-related diseases are to be minimized [14]. Human hygienic behaviour holds the key to effectively interrupting disease transmission [15]. Health benefits from improved sanitation, hygiene and water supply were estimated to give 36% reduction in incidence of diarrhea from improved excreta disposal, 33% reduction in the incidence of diarrhea from improved hygiene practices, 20% reduction in the incidence of diarrhea from improved water quantity, and 15% reduction in the incidence of diarrhea from improved water quality [16]. Similarly, a study by Brown et al. [14].observed that handwashing with soap, improved water quality, and proper excreta disposal reduced diarrhoea risk by 48%, 17%, and 36%, respectively. It is estimated that over 10 million productive days would be gained if access to both water and sanitation rose to 100% [17]. In Nigeria, all efforts to address the school health program have mostly stayed at the policy level, with little

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implementation. When it has been attempted, the focus has been on the outside rather than the inside of the schools [18].

Public schools are educational institutions owned and operated entirely by the government authority in Nigeria. In contrast, private schools are institutions owned and run entirely by an individual or a private body. The public schools in Nigeria are usually seen with dilapidated classroom blocks, shabby environments with pupils dressed in tattered uniforms, and squatting on the bare, dusty floor. In contrast, private schools are assumed to be associated with a good and hygienic environment. Presently, private schools are springing up all over the state and some are found in residential homes, uncompleted buildings, and shabby environments. Some of them lack resources to maintain the existing structures. Therefore, it will be worthwhile to investigate the environment where these children are being kept for most of their daytime to know if it is healthy. This study is necessitated by the need to know the state of the personal hygienic practices of school pupils as well as environmental hygiene conditions and to compare this status between the public and private schools, to make evidence-based recommendations on how to promote further or strengthen school-based health program in the state.

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Methods

Study Area

The study was conducted in Rivers State, one of the 36 states of the Federal Republic of Nigeria, with its capital in Port-Harcourt. It is located in the South-South region of the country. The state has a population of 5,185,400, according to the 2006 census report [19]. The coordination of the entire primary school system lies on the State Universal Basic Education Board (SUBEB).

Study Population

The public and private schools in the Port-Harcourt Local Government Area (PHALGA) of Rivers State and the pupils from both school types were the study populations.

Study Design

The study was a comparative cross-sectional evaluation of school health services in public and private primary schools in Rivers State. The sampling frame includes all fully registered public and private primary schools in the specified LGAs, whereas unregistered schools were omitted.

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Sample Size Determination

Sample size calculation was done using the formula for comparison of two proportions [20]:

$$N = \frac{\{Z_\alpha\sqrt{2\pi_1 (1- \pi_1)} - Z_\beta\sqrt{\pi_1 (1- \pi_1) + \pi_2 (1- \pi_2)}\}^2}{(\pi_1 - \pi_2)}$$

Z_α = the standard normal deviate score and at 95% Confidence Interval (CI) for a double tail, it is 1.96

Z_β = one-sided standard normal deviate score and at 80% CI for a double tail corresponds to 0.84

π_1 = proportion of government school children that wash hands with soap and water in a study carried out in Ghana by Steiner-Asiedu et al.[21] = 63%

π_2 = proportion of private school children that wash hands with soap and water in a study carried out in Ghana by Steiner-Asiedu et al. [21] =37%[51]

Substituting,

$$\frac{\{1.96\sqrt{2x0.63 (1- 0.63)} + 0.84\sqrt{0.63 (1-0.63) + 0.37(1-0.37)}\}^2}{0.63-0.37}$$

=58.58

Adjusting for non-response rate and assuming non-response of 10% from the pupils.

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The sample size thus becomes; 58.58/0.9= 65

This is the sample size for one group.

Therefore, the minimum sample size for both groups was 65 x 2= 130 pupils

Eligibility Criteria

All public and private schools within Port-Harcourt Local Government Area (LGA) were eligible for the study. Additionally, basic six pupils of both the public and private schools in the LGA were eligible for the study

Sampling Technique

Multistage sampling was used to select the target populations.

Stage 1: Selection of study L.G.A.

Port-Harcourt City Local Government Area (LGA) was selected from four (4) urban Local Government Areas with at least eight (8) registered public and private schools using a simple random sampling technique. The four LGAs were: Port-Harcourt City, Obio/Akpor, Eleme, and Oyigbo LGAs.

Stage 2: Selection of Schools

A list of all the schools in the selected LGA served as the sampling frame. Using a simple random sampling method, eight (8) schools were selected, 4 from the public and 4 from the private schools. The list of primary schools was obtained

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from the Library and Informatics Unit of the Ministry of Education, Podium Block Port Harcourt.

Stage 3: Selection of pupils

With the Basic 6 school register serving as the sampling frame, the proportionate distribution of sample size of 130 pupils to the eight schools gave approximately 17 pupils in each school. Simple random sampling was used to select a minimum of 17 pupils from the upper primary (Basic 6).

Data Collection Tools and Techniques

Data collection was done by a quantitative method.

An interviewer-administered questionnaire was used to obtain information on socio-demographic characteristics, knowledge, and practices of hygiene. In addition, each pupil was examined physically for the cleanliness of eyes, mouth, teeth, fingernails, hair, skin, and clothes using a scoring table.

These procedures were carried out mainly during the school break periods and took about three weeks to complete. Both the questionnaire and checklist were adapted from pre-existing tools in the literature [22–24].

Pre-testing of the questionnaire:

Pre-testing of the instrument was done at a different school from the selected study population, although in the same Local Government Area, and appropriate amendments were made after that. This was conducted to assess the suitability

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of the questionnaire with regard to duration, language appropriateness, and question comprehensibility.

Training of research assistants:

Two research assistants comprised a senior resident doctor and an assistant experienced in field work data collection. They were trained on the concept of the study. Each question in the questionnaire was explained in detail before the commencement of the study. The questionnaire was administered in the English language.

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Ethical Consideration

Ethical permission for the study was granted by the University of Port Harcourt Teaching Hospital (UPTH) Ethics Committee, Port Harcourt, Rivers State (UPTH/ADM/90/S.II/VOL.X/91). Permission was also given by the primary school system on the State Universal Basic Education Board (SUBEB), Rivers State. Informed consent (written) was obtained from the headmasters and parents of the participating students. Information obtained in the course of the study was treated with strict confidentiality. The project conferred no known risk on the research participants. Participants were treated with the utmost respect.

Data Presentation and Analysis

Data were entered into MS Excel and later exported to SPSS software package Version 16 for analysis. Data was summarized in tables. Differences in means were compared using Student's *t*-test for the quantitative data, while the qualitative data were compared using the Z test. Fisher's Exact Test was used in cases where the cell number was less than 5 in the data table. The statistical significance level was taken as *P*-value ≤ 0.05.

Limitations of the study

Some of these schools prepared their students before our arrival and asked them to appear neat on the appointment day, while some others instructed the

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cleaners to wash their toilets on our arrival. In such cases worn out uniforms were also assessed since they could not be changed overnight.

Variables and their Measurements

Part I: Knowledge and Practice of Hygiene among School Children

The variables assessed in the Knowledge, Attitude, and Practice of Hygiene among School Children included:

Knowledge: The proportion of pupils that had good knowledge of hygiene. There were 35 questions under 'knowledge' from the questionnaire. Each question has one correct answer, which was scored as 1; therefore, the maximum score for the assessment was 35, which was classified as 100%. Those who scored less than 25% (scores 0 to 7 points) were classified as very poor, 25% to 49% (8 to 16 points) as poor, 50% to 74% (17 to 25 points) as good and 75% to 100% (26 to 35 points) as very good.

Practice: The proportion of pupils that had good practice of hygiene. Under the 'practice', section, each correct practice answer was scored 1. There were 15 questions that gave 100% when all the scores were accurate. Those who scored less than 25% (scores 0 to 3 points) were classified as very poor, 25% to 50% (4 to 7 points) as poor, 51% to 74% (8 to 10 points) as good and 75% to 100% (11 to 15 points) as very good.

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Part II: Personal Hygiene

The personal hygiene assessed among the school children was the condition of the hair, eyes, ears, nails, skin, mouth/teeth, and clothing. The total score for each indicator was obtained by adding all the item scores. Also, quality scores representing very clean, clean, dirty, and very dirty were deduced using percentage scores under each indicator and the total scores.

The quality rank was as follows:

Very clean = scores >75%

Clean = scores between 50 and 75%

Dirty = scores between 25 and < 50%

Very dirty = scores <25

The percentage of the scores for each variable was ranked as shown below:

Table 1: Scoring Table for Personal Hygiene

Indicator	**Maximum score (100%)**	**Quality score**			
		Very clean (75-100%)	**Clean (50-<75%)**	**Dirty (25-<50%)**	**Very dirty (<25%)**
Hair	4	4	3	2	1
Eyes	2	2	1	0	0
Ears	3	3	2	1	0
Nails	4	4	3	2	1
Body (skin)	4	4	3	2	1
Mouth/Teeth	6	5	3	2	1
Clothing	5	4	3	1	0
Total	**28**	**22 - 28**	**15 - 21**	**8 - 14**	**<7**

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Results

A total of 80 questionnaires each were administered to the respondents in the Public and Private schools. Seventy-five (75) were retrieved from the public schools, and 64 from the private schools studied. All the respondents were from primary 5 (Basic 6) classes.

Table 2: Mean age of pupils by school ownership

School Ownership	Total Number	Mean Age	Std. Deviation	Std. Error Mean
Public	75	11.9	1.310	0.151
Private	64	10.8	1.915	0.239

t= 3.926, df=108.620, P = 0.001, mean difference of 1.11 (95% CI, 0.550 to 1.673)

The pupils of the public and private schools had mean ages of 12±1.3 and 11±1.9 years, respectively, and the difference was statistically significant (*P* = 0.001) as shown in **Table 2.**

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Table 3: Socio-demographic features of pupils by school ownership

Variable	School ownership	
	Public school (%) (n=75)	**Private school (%) (n=64)**
Sex		
Male	37 (49.3)	28 (43.8)
Female	38 (50.7)	36 (56.3)
χ2 (p-value)	0.609(0.313)	df=1
Living arrangement		
Guardian	17 (22.7)	12 (18.8)
Parents	58 (77.3)	52 (81.3)
χ2 (p-value)	0.321(0.571)	df=1
No of rooms		
One	28 (37.3)	17 (26.6)
Two	32 (42.7)	20 (31.3)
Three	11 (14.7)	15 (23.4)
Four	2 (2.7)	7 (10.9)
More than four	2 (2.7)	5 (7.8)
χ2 (p-value)	**9.325 (0.053)***	**df=4**
Father's Education		
No formal education	1 (1.3)	0 (0.0)
Primary school	4 (5.3)	2 (3.1)
Secondary school	25 (33.3)	8 (12.5)
Tertiary Institution	45 (60.0)	54 (84.4)
χ2 (p-value)	**10.437(0.015)***	**df=3**
Mother's Education		
No formal education	2 (2.7)	1 (1.6)
Primary school	3 (4.0)	3 (4.7)
Secondary school	31 (41.3)	9 (14.1)
Tertiary Institution	39 (52.0)	51 (79.7)
χ2 (p-value)	**13.246(0.004)***	**df=3**

*Statistically significant (p<0.05); df=Degree of freedom; χ2=Chi-Square

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In both public and private schools, females were in higher proportions; however the differences were not statistically significant as the χ^2 (p-values) 0.609(0.313) indicated. The proportions of pupils who live with their parents were higher in both public and private schools (77.3% vs. 81.3%); however, the differences were not statistically significant as the χ^2 (p-values) 0.321 (0.571). The proportions of pupils who live in at least two rooms were higher in both public and private schools (42.7% vs. 31.3%), and these differences were statistically significant as the χ^2 (p-values) 9.325 (0.053). The parents of the pupils in the private schools were significantly better educated than those in the public schools (fathers: 84.4% vs. 60.0%, P=0.015; mothers: 79.7% vs. 52.0% P=0.004) respectively, as shown in **Table 3.**

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Table 4: Parents occupation by school ownership

Variable	School ownership	
	Public school (%) (n=75)	**Private school (%) (n=64)**
Father's Occupation		
Professional	13 (17.3)	24 (38.1)
Business	26 (34.7)	14 (22.2)
Administration	18 (24.0)	16 (25.4)
Artisan	12 (16.0)	3 (4.8)
Armed Forces	6 (8.0)	6 (9.5)
χ2 (p-value)	**11.431(0.022)***	**df=4**
Mother's Occupation		
Professional	5 (6.8)	3 (4.8)
Business	41 (55.4)	29 (46.8)
Administration	17 (23.0)	23 (37.1)
Artisan	1 (1.4)	1 (1.6)
House Wife	10 (13.5)	6 (9.7)
χ2 (p-value)	3.425 (0.489)	df=4

*Statistically significant (p<0.05); df=Degree of freedom; χ2=Chi-Square

The fathers from the private schools were more of professionals (38.1%) while the fathers from the public schools were mainly businessmen (34.7%) and administrators (24.0%), and the difference was found to be statistically significant (p=0.022). A high proportion of mothers in public and private schools were business women (55.4% vs. 46.8%) and administrators (23.0% vs. 37.1%). However, the difference was not statistically significant (p=0.489), as shown in **Table 4**.

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Table 5 Knowledge of hygiene among the pupils by school ownership

Variables assessed	Public (n=75) (%) correct	Private (n=64) (%) correct	X^2	p-value
Knowledge of the meaning of germs	68 (90.7)	62 (96.9)	2.198	0.138
Knowledge of where germs are found	68 (90.7)	63 (98.4)	**3.844**	**0.050***
Knowledge of how germs can be stopped	74 (98.7)	64 (100.0)	0.860	0.354
Knowledge of the meaning of hygiene	73 (97.3)	64 (100.0)	1.732	0.188
Knowledge of handwashing with soap	75(100.0)	64(100.0)	-	-
Hands may have contact with feces while cleaning after defaecation	43(57.3)	44(68.8)	1.922	0.166
Knowledge of worm infestation	59(78.7)	34(54.0)	**10.175**	**0.001***
Knowledge on waste disposal by composting	41(54.7)	23(37.1)	**4.876**	**0.027***
Knowledge on how malaria is not spread	34(45.3)	40(63.5)	**4.088**	**0.043***

*Statistically significant ($p<0.05$); $\chi 2$=Chi-Square

Generally, pupils from private schools were more knowledgeable about hygiene compared to those from public schools. Statistically significant differences were observed for knowledge of where germs are found**,** worm infestation, disposal of waste, and how malaria is not spread (p-value = 0.050, 0.001, 0.027, 0.043) as shown in **Table 5**.

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Table 6: Overall knowledge of hygiene among pupils by school ownership using the scoring table

Knowledge	Public (%) (n=75)	Private (%) (n=64)
Very Good	68 (90.7)	59 (92.2)
Good	7 (9.3)	5 (7.8)
χ2 (p-value)	0.101(0.97)	df=3

χ2=Chi-Square

Public and private school pupils had high scores on hygiene knowledge, 90.7%, and 92.2%, respectively, and no statistical difference was observed as shown in **Table 6**.

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Table 7: Source of hygiene information among pupils from public and private schools

Hygiene information	Public (%) n=75	Private (%) n=64
Parents	21(28.0)	29(45.3)
Schools	48(64.0)	31(48.4)
Friends	1(1.3)	0(0.0)
Television	5(6.7)	4(6.3)
χ2 (p-value)	5.211(0.157) df=3	

χ2=Chi-Square

The predominant source of hygiene information among pupils from public and private was school (64.0% vs. 48.4%), followed by parents (28.0% vs. 45.3%); although the differences observed were found not to be statistically significant as shown in **Table 7**.

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Table 8: Self-assessment on the practice of hygiene among the pupils by school ownership

Variables assessed	Public (n=75) (%) correct	Private (n=64) (%) correct	X^2	p-value
Always practices good hygiene	59 (78.7)	43 (67.2)	2.330	0.127
Wash hands with soap and water always	53 (70.7)	49 (76.6)	0.615	0.433
Wash hands with soap and water after toilet use	74(98.7)	64(100.0)	0.860	0.354
Bath with soap at least twice daily	71(94.7)	59(92.1)	0.615	0.433
Cut the hair when difficult to comb	64(85.3)	53(82.8)	0.165	0.685
Brush teeth morning and evening	52(69.3)	47(73.4)	0.284	0.594
Cut nail every week	6(74.7)	60(93.8)	**9.107**	**0.003***
Bite of fingernails always	6(8.0)	7(10.9)	0.351	0.553
Wash uniform after wearing it once	16(21.3)	22(34.4)	2.957	0.086

*Statistically significant ($p<0.05$); $\chi 2$=Chi-Square

Generally, no statistically significant difference on self-assessment on the practice of hygiene among pupils in private and public school was observed, except on if they cut nails every week, which was higher for private compared to public (93.8% vs. 74.7%) (P=0.003) as shown in **Table 8.**

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Table 9: Overall practice of hygiene among the pupils by school ownership using the scoring table

Practice	Public (%) (n=75)	Private (%) (n=64)
Very Good	46 (61.3)	44 (68.8)
Good	28 (37.3)	17 (26.6)
Poor	1 (1.3)	3 (4.7)
χ2 (p-value)	2.881(0.277)	df=3

χ2=Chi-Square

Pupils from the private schools had a higher proportion in the 'very good' scale of the practice of hygiene, although the difference was not statistically significant as shown in **Table 9**.

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Table 10: Physical examination of pupils on personal hygiene by school ownership

Indicators	Public (n=75)	Private (n=64)	X^2	p-value
	Yes (%)	Yes (%)		
Hair				
Clean hair	61(81.3)	55(85.9)	0.530	0.501
Well cut/made	52(69.3)	43(67.2)	0.073	0.856
Absence hair lice	73(97.3)	62(96.9)	0.026	1.000
Absence scalp lesion	65(86.7)	61(95.3)	3.045	0.142
Ear				
Clean ear	67(89.3)	58(90.6)	0.064	1.000
Absence of ear wax	71(94.7)	58(90.6)	0.845	0.513
Good skin condition	62(82.7)	64(100.0)	**12.238**	**0.001***
Eye				
No dirt around the eyes	74(98.7)	62(96.9)	0.525	0.595
Mouth/teeth				
Clean mouth	72(96.0)	61(95.3)	0.040	1.000
Clean teeth	43(57.3)	40(62.5)	0.383	0.604
Absence mouth ulcer	70(93.3)	62(96.9)	0.906	0.452
Absence mouth odour	70(93.3)	59(92.2)	0.068	1.000
Absence food particles in	58(77.3)	55(85.9)	1.681	0.275
teeth	67(89.3)	60(93.8)	0.854	0.385
Absence tooth cavity/decay				
Nail	35(46.7)	35(54.7)	0.889	0.396
Clean nails	39(52.0)	41(64.1)	2.057	0.171
Well trimmed/cut	34(45.3)	24(37.5)	0.871	0.391
No dirt under nail				
Skin	66(88.0)	60(93.8)	1.347	0.382
Clean face	48(64.0)	49(76.6)	2.585	0.139
Clean hands	54(72.0)	53(82.8)	2.278	0.159
Clean legs	42(56.0)	58(90.6)	**20.510**	**0.001***
Absent skin lesions				
Clothing	57(76.0)	56(87.5)	3.003	0.126
Clean cloth	49(65.3)	52(81.3)	4.404	0.055
Clean stockings	53(70.7)	55(85.9)	**4.647**	**0.041***
Properly buttoned or zipped	60(80.0)	59(92.2)	**4.164**	**0.053***
Shoe lace properly tied	66(88.0)	60(93.8)	1.347	0.382
Absence of bad odour				

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*Statistically significant ($p<0.05$); $\chi 2$=Chi-Square

Generally, the hygiene examination showed higher scores among the private schools. Statistical significant differences were observed in some of the indicators in favour of the private schools, especially in good skin condition (no lesion in the ear), absent skin lesions, and proper dressing as shown in **Table 10**.

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Table 11: Physical examination of pupils on personal hygiene by school ownership using the scoring table

Indicators	Public (%) (n=75)	Private (%) (n=64)
Hair		
Very clean	60 (80.0)	54 (84.4)
Clean	11 (14.7)	8 (12.5)
Dirty	4 (5.3)	2 (3.1)
χ2 (p-value)	0.589(0.778)	
Eye	62 (82.7)	53 (82.8)
Very clean	12 (17.3)	10 (17.2)
Dirty	0.016(1.000)	
χ2 (p-value)		
Ear	68 (90.7)	60 (93.8)
Very clean	7 (9.3)	4 (6.3)
Dirty	0.45 (0.364)	
χ2 (p-value)		
Mouth/teeth	53 (70.7)	56 (87.5)
Very clean	6 (8.0)	7 (10.9)
Clean	13 (17.3)	1 (1.6)
Dirty	3 (4.0)	0 (0.0)
Very dirty	**12.654 (0.003)***	
χ2 (p-value)		
Nails	29 (38.7)	37 (57.8)
Very clean	20 (26.7)	8 (12.5)
Clean	6 (8.0)	1 (1.6)
Dirty	20 (26.7)	18 (28.1)
Very dirty	**8.975(0.027)***	
χ2 (p-value)		
Skin	53 (70.7)	56 (87.5)
Very clean	6 (8.0)	7 (10.9)
Clean	13 (17.3)	1 (1.6)
Dirty	3 (4.0)	0 (0.0)
Very dirty	**12.654 (0.003)***	
χ2 (p-value)		
Clothing	52 (69.3)	54 (84.4)

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Very clean	12 (16.0)	6 (9.4)
Clean	6 (8.0)	4 (6.3)
Dirty	5 (6.7)	0 (0.0)
Very dirty		
χ2 (p-value)	6.609(0.085)	

*Statistically significant (p<0.05); χ2=Chi-Square

Generally, the proportions of pupils with 'very clean' scores were higher in the private schools than the public schools. There were significant differences in the cleanliness of the nails, body (skin), and mouth/teeth with p-values of 0.027, 0.003, and 0.003, respectively as shown in **Table 11**.

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Discussion

This study observed the state of the personal hygiene of the schools in Port-Harcourt City LGA. Both public and private school pupils were found to have ‘very good’ knowledge of hygiene in this study. This is in agreement with another Nigeria study conducted in Zaria, which observed that students' knowledge of environmental hygiene was high for all classes [25], unlike a similar study done in Ethiopia[22] where only 52% of schoolchildren were classified as having proper hygiene knowledge. Also, in Panipat, India, most of the respondents had low scores on hygiene knowledge [26]. The high knowledge of hygiene observed in the present study results from health education included in the school curriculum. Most students (75%) got handwashing with soap information during their primary school period and their parents. The first health educators of the child are primarily from school and the parent, which is similar to findings from a Finland study [27]. In a Nigerian study done in Abraka, children got their hygiene information from parents (35%) followed by the schools (34%) [28]. In Zaria, a study outcome indicated that the students' knowledge of environmental hygiene was high for all classes and those students whose fathers were educated scored slightly higher than those whose fathers were illiterate [25]. This is in line with this study where the proportion of parents who attained up to the university education was higher among the private schools than the public schools; likewise, the knowledge of hygiene was generally higher among the private school pupils, but the difference was not statistically significant.

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In the present study, all the pupils knew that good hygiene means washing hands with soap and water, but the proportion that actually practiced hygiene was low in both schools. This is similar to the study at Panipat, where most respondents had low scores on personal hygiene practice [26]. In Abraka, the average practice score to basic personal hygiene among school children was 54.9% [28] which was also lower than knowledge scores. Knowledge of hygiene is not enough to prevent transmission of germs but practice, and until the children learn to practice good hygiene, infectious diseases will continue to thrive in and out of the school environment [10]. On observation of the personal hygiene of pupils in this study, the proportions of pupils with 'very clean' scores were higher in the private schools than the public schools. There were statistically significant differences in the nails, body (skin), and mouth/teeth cleanliness. These findings is similar to the study carried out in Nigeria, where the result of physical inspection of the children, when compared with private and public schools, revealed that 40.1% and 73.4 % had dirty nails while 9.1% and 26.2 % of them had dirty hair respectively (p=0.001) [28].

Hand hygiene in another study observed that only between 15% and 50% of the participants engaged in it [29]. In the present study, it was obvious that the respondents over-reported that they washed hands with soap and water after toilet use (public=98.7%; private=100%). In Ethiopia, although 76.7% of students reported that hand washing after defecation was important, only 14.8% reported actually following this practice [22]. International Water Resources report observed that, the facilities available in the schools, like water for handwashing

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and latrines, were not available to most school children but staff [16]. Although there was no statistically significant difference, the private school pupils were found to brush their teeth more often than the public school pupils. This is contrary to the study in Libya where 42.1% of pupils did not brush their teeth[30] and in Romania[31] and India[32] where 37% and 30.7% of pupils brushed their teeth at least twice a day respectively. In North Jordan, approximately 69 % of the study sample brushed their teeth at least twice daily.[33] The study done in Turkey showed that there was a statistically significant relationship between the parents' tooth-brushing habit and the children's tooth brushing and between the parents' frequency of tooth brushing and the children's frequency of tooth brushing[34].

Conclusion

The study showed ‘very good’ knowledge of hygiene among primary school children in both the public and private schools but this was not reflected in their practices of basic personal hygiene, especially among the public school pupils.

It appeared that parental socio-economic background has an influence on the personal hygiene of the pupils because higher percentage of pupils from the private schools received hygiene education from their parents who obviously had higher educational qualifications. Secondly, because they are likewise run as a profit-oriented business, private schools have easier access to funding. Because they compete for students with other private schools, some of the available structures that complement school health program activities are available. As a

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result, they have a tendency to give various services not because they understand the School Health Programme's requirements better than the public schools, but as a business model to attract clients. Public schools, on the other hand, wait for money from the government to be available for all activities. They are normally prohibited from participating in fund-raising activities, and when they do, the monies available are limited. This study forms part of the baseline on which future programming and interventions for addressing hygiene behaviour among schools and school children will be evaluated.

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