

Evaluating Hygiene Knowledge and Attitudinal Differences Among Primary School Pupils in Private and Public Schools in Port Harcourt

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ABSTRACT

Ensuring proper hygiene practices among school-aged children is critical for safeguarding their health and reducing the spread of communicable diseases. This study evaluates and compares the hygiene knowledge and attitudes of pupils enrolled in public and private primary schools in Port Harcourt, Nigeria. Port Harcourt is a city of over three million people, and the most economic State in Nigeria outside Lagos. A cross-sectional survey design was employed, and data were collected from a stratified sample of two hundred and twenty (220) pupils using a structured, pre-tested questionnaire covering key domains of personal and environmental hygiene. Descriptive statistics were used to summarize pupils' responses, while independent sample t-tests and chi-square analyses determined significant differences between the two school categories. The findings reveal notable variations in hygiene awareness and attitudes, with pupils from private schools demonstrating significantly higher levels of knowledge (58 percent) compared to 43 percent of public schools' pupils ($p = 0.0655$). Attitudinal patterns also differed across both groups; private school pupils had a more positive attitude towards hygiene, with 73 percent showing a positive response, compared to 54 percent of public-school pupils ($p = 0.00056$), reflecting disparities in exposure, school hygiene infrastructure, and parental guidance. The study underscores the need for strengthened hygiene education programs, particularly in public schools, and highlights the importance of coordinated efforts between government, educators, and parents to promote healthier environments for children. Targeted interventions and sustained awareness campaigns are recommended to bridge the knowledge gap and foster positive hygiene behaviors among primary school pupils in Port Harcourt.

Keywords: hygiene, knowledge, public-health, attitude, pupils, port-harcourt

INTRODUCTION

Hygiene practices among school-aged children are fundamental to achieving optimal health outcomes and preventing the spread of communicable diseases. In low- and middle-income countries such as Nigeria, inadequate hygiene behaviours among children contribute significantly to the burden of infectious diseases, including diarrheal illnesses, respiratory infections, and parasitic infestations (Ezeonu and Ezeonu, 2018; World Health Organization [WHO], 2020). Primary schools play a critical role in shaping children's hygiene habits, as they serve as both learning environments and social settings where young learners are exposed to daily hygiene routines and health-related information. Consequently, improving hygiene knowledge and attitudes at this formative age is essential for fostering long-term healthy behaviors (Afolabi and Aluko, 2021).

In many Nigerian communities, however, disparities in hygiene knowledge and practices persist between pupils in public and private schools. These differences are often linked to variations in school infrastructure, teacher training, parental involvement, and exposure to health education programs (Adagbada et al., 2020). Private schools are generally perceived to offer better sanitary facilities and more structured health education initiatives, while public schools often characterized by overcrowding and underfunded infrastructure face greater challenges in maintaining hygienic learning environments (Umeh and Adekeye, 2022). Such inequalities may influence pupils' understanding of hygiene concepts and shape their attitudes toward practices such as handwashing, waste disposal, and personal cleanliness.

Port Harcourt, a rapidly urbanizing city in Nigeria's South-South region, presents a unique context for evaluating these differences. The city's diverse school landscape, ranging from high-cost private institutions to resource-constrained public schools, provides an opportunity to assess how structural disparities shape children's hygiene-related outcomes. Existing studies have highlighted general hygiene challenges within Nigerian schools (Olorunfemi and Bello, 2019), but empirical evidence comparing hygiene knowledge and attitudes between private and public primary school pupils in Port Harcourt remains limited.

Moreover, children's hygiene behavior is known to be influenced not only by school-based interventions but also by household characteristics, socioeconomic background, and parental modeling. Studies have shown that children from higher socioeconomic households often have greater exposure to hygiene information, better access to sanitation facilities, and stronger reinforcement of health-promoting behaviors at home (Oduwale and Fawole, 2020). In contrast, pupils from disadvantaged households may face barriers such as limited access to clean water, inadequate sanitation, and insufficient parental guidance, which can hinder the development of positive hygiene attitudes. These factors further widen the gap between pupils in public and private schools, making it essential to understand the relative contribution of home and school environments to children's hygiene outcomes.

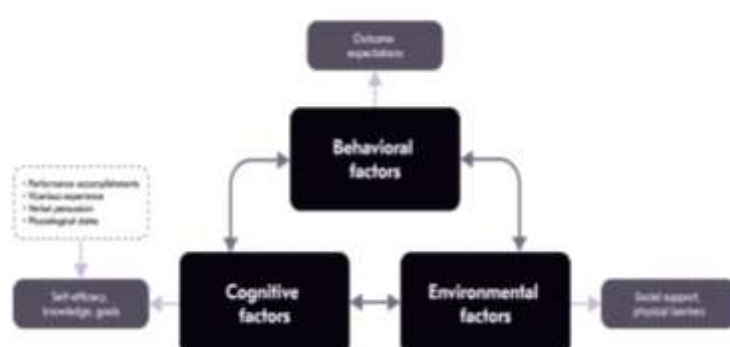
Also, global health guidelines emphasize the importance of school-based hygiene education as a cost-effective and sustainable strategy for disease prevention (United Nations Children's Fund [UNICEF], 2021). Integrating hygiene education into school curricula and strengthening Water, Sanitation, and Hygiene (WASH) facilities can significantly improve children's health, school attendance, and overall well-being. However, the effectiveness of these interventions often depends on the capacity of schools to implement them consistently, an area where public schools in Nigeria commonly experience resource limitations. Understanding how these contextual factors manifest in Port Harcourt's primary schools is crucial for designing equitable, evidence-based interventions that can bridge existing knowledge and attitudinal gaps.

This study therefore seeks to evaluate and compare hygiene knowledge and attitudinal patterns among primary school pupils in private and public schools in Port Harcourt. By employing a cross-sectional survey design and statistically examining differences between the two groups, this research provides evidence on how school type influences hygiene awareness and behavioral tendencies. The findings aim to inform health promotion strategies and support the development of targeted interventions that can help bridge existing disparities. Ultimately, improving hygiene education within the school system is crucial for safeguarding children's well-being and creating healthier learning environments across Port Harcourt.

Theoretical perspectives

This study is premised on Social Cognitive Theory (SCT) and the theory of planned behaviour (TPB).

The social cognitive theory was formulated by Albert Bandura and examines the reciprocal relations between the individual and the environment, and behavior. This theory is very useful in explaining how individuals acquire and sustain specific behavioral patterns and in planning interventions to facilitate healthful behavior change. According to SCT, learning is a social process involving a bidirectional, active transaction between the person and the environment, as well as the behavior.



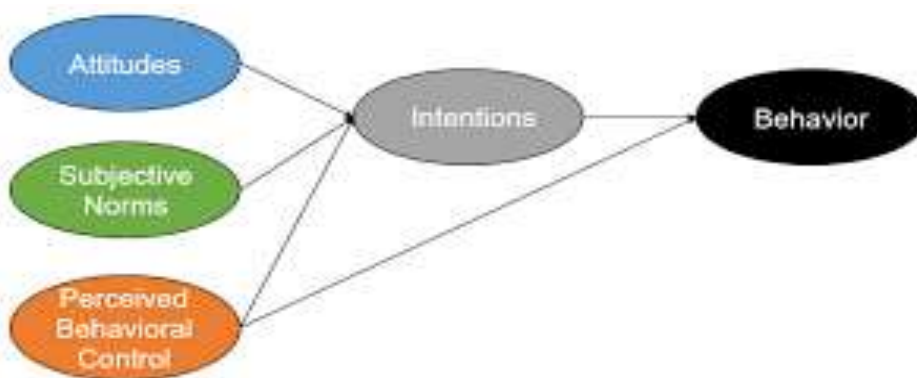
Source: author's compilation

To assess and compare the knowledge of hygiene practices of pupils of private and public primary school in Port Harcourt.

To assess and compare the attitude of hygiene practices of pupils of private and public primary school in Port Harcourt.

Theory of Planned Behavior (TPB)

On the other hand, the Theory of Planned Behavior (TPB) is a precise psychological theory that connects beliefs and actions, invented in 1985 by Icek Ajzen. It is an elaboration of the Theory of Reasoned Action (TRA) by including another construct, perceived behavioral control, to address conditions that may influencing the individual's intentions and behaviors beyond his or her volition. In TPB, it is believed that behavior is controlled by behavioral intentions and three components which include attitude toward the behavior, subjective norm, and perceived behavioral control. This theory gives a clear account of the manner in which and the reasons why people perform particular activities.



Source: author's compilation

MATERIALS AND METHOD

The study was conducted in Port Harcourt, the capital of Rivers State, South-South Nigeria. The city is characterized by high population density, diverse socioeconomic groups, and varied school types with differing levels of infrastructure, making it suitable for comparative hygiene studies among children (NBS, 2023). Port Harcourt is widely regarded as Nigeria's most economically vibrant city after Lagos, with a human population estimated at over three million residents. The state has a multi ethnic population with different cultures and this make up the social structure of the state. The population density of the people in the region especially in Port Harcourt and other surrounding towns has created increased urbanization and development.

The management and coordination of primary schools in Port Harcourt is under the State Universal Basic Education Board (SUBEB). This board safeguards the quality of education and makes certain that schools are ready to offer quality education to children. Primary schools in Port Harcourt consist of both government owned (public) schools and private schools. The city's primary schools provide education for students from different social statuses, which is typical for the region. These schools have problems like poor infrastructure and other amenities and are very important in education systems. The population of the study comprised primary school pupils enrolled in registered public and private schools within the Port Harcourt metropolis. A stratified random sampling technique was employed to ensure proportionate representation of both school categories, following standard recommendations for educational and public health surveys (Etikan and Bala, 2017).

A total of 220 pupils participated in the study, comprising 110 pupils in public schools and 110 pupils in private schools. The sample size was determined using Lemeshow's formula of proportional estimation and is suitable for population-based studies, expressed in equation (1) [24, as applied in cross-sectional studies and subsequently allocated across both strata (public and private schools). Within each selected school, pupils were randomly chosen from upper primary classes (Primary 4–6), consistent with prior hygiene-related school-based studies (Babalola et al., 2020).

The sample size formula is given as,

$$n = S^2_{1-\alpha/2} \frac{P(1-M)}{d^2} \quad (1)$$

Where:

n = sample size

$S^2_{1-\alpha/2}$ = error term at 0.64 (90 percent confidence interval)

d = relative precision at 0.10.

M = prevalence of household's inability to access adequate food (insecurity) in

Port Harcourt at 50.49 percent [20].

Data were collected using a structured, pre-tested questionnaire developed based on existing tools for assessing school hygiene knowledge and attitudes (WHO, 2009; Freeman et al., 2014). The instrument consisted of Demographic characteristics, hygiene knowledge items (personal hygiene, handwashing, environmental hygiene), and attitudinal measures using a 5-point Likert scale

The questionnaire was validated for content adequacy by three experts in public health and educational research. A pilot test involving 20 pupils from a non-participating school produced a Cronbach's alpha of 0.82, indicating strong internal consistency (Tavakol and Dennick, 2011). Trained research assistants administered the instruments using an interviewer-assisted approach to ensure comprehension among younger respondents.

Data were coded and entered into **SPSS version 26** for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize pupils' hygiene knowledge and attitudinal outcomes. To compare public and private school pupils:

Independent sample t-tests were applied for continuous knowledge scores while Chi-square tests assessed differences in categorical variables, consistent with analytical approaches in similar hygiene studies (Vivas et al., 2016; Oloruntoba et al., 2014). Significance was set at $p < 0.05$.

The t-test equation is applied as:

Test of difference in mean value of continues knowledge scores among the public and private schools' pupils was analyzed using the following mean formula (as used by Edaba, 2025):

$$Z = (\bar{x}_1 - \bar{x}_2) / \sqrt{[(W_{21} / P_1) + (W_{22} / P_2)]} \quad (2)$$

Where,

Z = calculated worth of the statistical significance of the mean difference in hygiene knowledge of public and private schools' pupils.

$\bar{x}_1$ = continues knowledge scores (mean) among pupils in public schools

$\bar{x}_2$ = continues knowledge scores (mean) among pupils in private schools

W_{21} = sample variance of hygiene knowledge among pupils in public schools

W_{22} = sample variance of hygiene knowledge among pupils in private schools

P_1 = number of observations of pupils in public schools

P_2 = number of observations of pupils in private schools

The chi square equation which assessed differences in categorical (public and private schools) variables is expressed as follows:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad (3)$$

Where:

O = observed share of hygienic knowledge among pupils in primary schols (percentage)

E = expected share of hygienic knowledge among pupils in primary schols (percentage)

O-E = deviations

$(O_i - E_i)^2$ = deviation squared and weighted

Also, to assess attitudinal measures of the pupils towards hygiene, 5-point Likert scale mean is given as:

$$LM = \frac{\sum(f \times w)}{N} \quad (4)$$

Where:

LM = Likert weighted mean

f = frequency of each response

w = weight assigned to each response

N = total number of respondents

RESULTS AND DISCUSSIONS

Age Distribution of Pupils (Private + Public Schools)

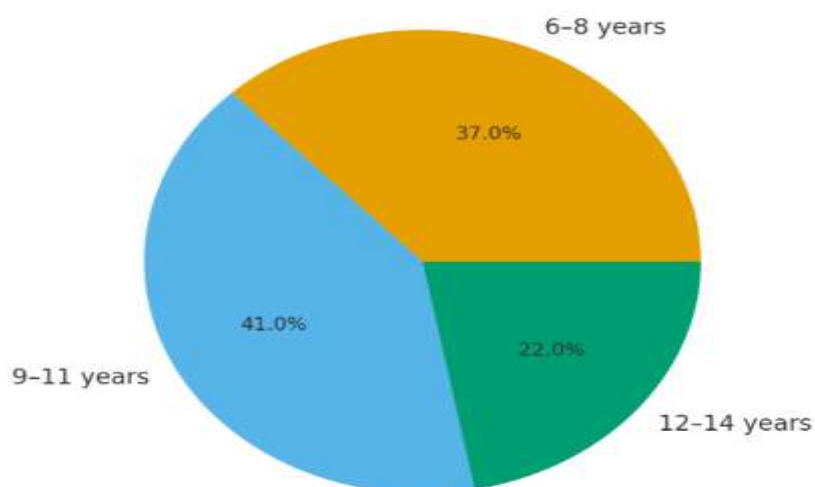


Figure 1: Age distribution of pupils in private and public primary schools

Source: field survey, 2024

Across both private and public schools, the age distribution of pupils was relatively balanced, with most students falling within the 6–11 years range. In total, younger pupils (6–8 years) accounted for nearly half of the population, while the 9–11 years group represented a slightly higher proportion overall. Pupils aged 12–14 years were the least represented in both school types.

	Private-School (n=100)	Public-School (n=100)
Questions		
It is recommended to wash the hands with soap and water prior to taking a meal to prevent the spread of germs.	54 (54%)	50 (50%)
The most important oral hygiene practice that one should follow is that one should brush his or her teeth at least twice a day.	60 (60%)	48 (48%)
Everything that one can put in a list of things that people share for cleanliness is good to share such as toothbrushes and towels.	88 (88%)	82 (82%)
Sneezing or coughing spread germs so make sure to cover your mouth with your hand when you do so.	58 (58%)	52 (52%)
Keeping oneself clean is a crucial aspect of personal hygiene.	55 (55%)	47 (47%)
When washing your hands you do not require any soap since water alone helps in cleaning the hands.	92 (92%)	84 (84%)
It prevents skin diseases from occurring as well as keeps the skin surface clean of germs and dirt since the majority of germs enter the body through the skin.	63 (63%)	55 (55%)
If food drops on the floor and does not show any sign of dirt, then one can take it and eat it.	91 (91%)	86 (86%)
Nail hygiene is equally important as washing hands, because travels germs and infections down to the tips of our fingers.	58 (58%)	50 (50%)
This is hygiene practice that involves use of the toilet after it has been used to help making the environment clean.	61 (61%)	54 (54%)

Source: field survey, 2024

Table 1 presents the distribution of hygiene-related knowledge among pupils in private and public primary schools. Overall, pupils in private schools demonstrated slightly higher awareness across most hygiene indicators than their public-school counterparts. This pattern aligns with earlier studies indicating that private-school pupils often have greater exposure to structured hygiene education and better resourced learning environments (Adebayo and Ojetola, 2021; Omotade et al., 2020).

Regarding handwashing knowledge, 54% of private-school pupils and 50% of public-school pupils correctly acknowledged the importance of using soap and water before meals. Although both groups showed moderate awareness, the relatively low proportion suggests a gap in understanding of basic hygiene practices. This finding

is consistent with research by Ekanem et al. (2022), who reported that many Nigerian pupils possess incomplete knowledge about hand hygiene despite its role in preventing communicable diseases.

Knowledge of oral hygiene, particularly brushing twice daily, followed a similar pattern, with 60 percent of private-school pupils and 48 percent of public-school pupils responding correctly. Oral hygiene education remains insufficient among school-aged children in many low-resource contexts (Okeigbemen, 2020), suggesting the need for school-based oral health programs. Also, there was a remarkably large majority of pupils in both school types, 88 percent in private schools and 82 percent in public schools, incorrectly believed that personal items such as toothbrushes and towels are safe to share. This misconception indicates a significant knowledge deficit in understanding disease transmission through fomites. Prior studies have similarly documented poor awareness regarding the dangers of sharing personal hygiene items among children in Nigeria (Afolabi et al., 2019). In terms of respiratory hygiene, both school groups showed only moderate knowledge: 58 percent of private-school pupils and 52 percent of public-school pupils recognized that coughing and sneezing can spread germs. This mirrors findings from similar school-based assessments in sub-Saharan Africa, which highlight inconsistent knowledge of respiratory etiquette among children (Assefa and Kumie, 2020).

The belief that **handwashing does not require soap**, held by 92 percent of private-school pupils and 84% of public-school pupils, represents one of the most critical gaps identified. This misconception contradicts global public-health recommendations emphasizing the role of soap in removing pathogens (World Health Organization, 2020). This result suggests insufficient hygiene curriculum emphasis on proper handwashing techniques. Knowledge of food hygiene was also poor, with 91 percent of private-school pupils and 86 percent of public-school pupils incorrectly stating that dropped food can be eaten if it appears clean. Similar findings have been reported in earlier studies, where pupils underestimated the risk of microbial contamination in apparently clean environments (Onyeaghala and Ojo, 2021).

Finally, while awareness of nail hygiene and the importance of cleanliness for preventing skin infections was moderately high in both groups, it still fell short of the levels recommended for effective personal hygiene behavior. Prior empirical studies stress the importance of nail hygiene in preventing parasitic and bacterial infections among children (Uwaezuoke and Duru, 2019).

Table 2: Knowledge Levels of Pupils in both public and private schools

	Private School (n=100)		Public School (n=100)	
Knowledge Levels	Frequency	Percentages (%)	Frequency	Percentages (%)
Good knowledge	58	58.0%	43	43.0%
Average Knowledge	22	22.0%	35	35.0%
Poor Knowledge	20	20.0%	22	22.0%
Total	100	100.0%	100	100.0%
Chi-Square Statistic (χ^2)	5.45			
Degrees of Freedom (df)	2			
p-value	0.0655			

Source: field survey, 2024

Table 2 shows a comparison of hygiene knowledge levels among pupils in private and public primary schools in Port Harcourt. Overall, the findings reveal noticeable differences in knowledge distribution between the two groups. A higher proportion of private-school pupils demonstrated good hygiene knowledge (58 percent) compared to 43 percent among public-school pupils. This pattern aligns with previous studies indicating that pupils in private schools often have better access to structured health education, improved sanitation facilities, and stronger teacher–pupil engagement, which collectively enhance hygiene literacy (Freeman et al., 2014; Babalola et al., 2020).

Furthermore, 35% of public-school pupils fell within the *average knowledge* category, compared to 22 percent in private schools. This suggests that while public-school pupils possess some understanding of hygiene practices, gaps remain in their comprehension of essential hygiene concepts. Prior research has shown that such disparities may be linked to differences in school environment, availability of instructional materials, and parental socioeconomic factors (Vivas et al., 2016; Oloruntoba et al., 2014).

The proportion of pupils with poor knowledge was similar across both groups, with 20% in private schools and 22 percent in public schools. Although the differences in poor knowledge levels were minimal, the pattern indicates that a segment of pupils in both systems lack foundational hygiene awareness, which increases susceptibility to preventable infections (WHO, 2009; Curtis & Cairncross, 2003). This underscores the need for strengthened health education initiatives irrespective of school type.

The chi-square test ($\chi^2 = 5.45$, $df = 2$, $p = 0.0655$) shows that the observed differences in knowledge distributions are not statistically significant at the 5 percent level. However, the trend remains practically meaningful and consistent with evidence from low- and middle-income countries, where private school pupils tend to outperform public school pupils in health-related knowledge due to better infrastructure and more frequent hygiene-focused instructional activities (UNICEF, 2020).

Although statistical significance was not achieved, the direction of the findings points to an existing knowledge advantage among private school pupils. Informal learning experiences, parental guidance, and access to better WASH (Water, Sanitation, and Hygiene) facilities may contribute to the observed differences. Strengthening hygiene education policies in public schools, alongside targeted curriculum-based interventions, could help bridge this knowledge gap (Adegboye et al., 2021).

CONCLUSION AND RECOMMENDATION

Conclusion

This study examined the hygiene knowledge and attitudes of pupils in public and private primary schools in Port Harcourt, Nigeria, and the findings highlight important disparities that have implications for child health and school-based health promotion. The results show that pupils in private schools demonstrated comparatively higher levels of hygiene knowledge and more positive attitudes than their counterparts in public schools. Although overall awareness was moderate across both groups, the significant difference in attitudinal outcomes suggests unequal access to hygiene education, variations in school environments, and differences in parental influence. These findings reinforce existing literature indicating that structural and contextual factors such as school resources, teacher capacity, and home support which play a critical role in shaping children’s hygiene behaviours. The gaps observed, particularly among public-school pupils, underscore the urgent need for interventions that strengthen hygiene education and ensure that all pupils acquire essential skills for preventing communicable diseases. Ultimately, cultivating long-term positive hygiene behaviours among school-aged children requires an integrated approach involving schools, parents, and health authorities.

Recommendations

1. **Strengthen School-Based Hygiene Education:** Public schools, in particular, should intensify structured hygiene lessons using interactive and age-appropriate methods. Incorporating hygiene topics into the regular curriculum and conducting routine demonstrations can enhance children’s understanding and retention.

2. **Improve Hygiene Infrastructure in Schools:** Government and school administrators should prioritize providing adequate facilities such as clean water, functional toilets, handwashing stations, and soap. These improvements will enable pupils to translate knowledge into practice.
3. **Teacher Training and Capacity Building:** Continuous professional development programs should be offered to teachers to equip them with effective strategies for delivering hygiene education and reinforcing positive hygiene behaviours among pupils.
4. **Parental and Community Engagement:** Parents and caregivers should be sensitized through community outreach or school-led programs to reinforce proper hygiene practices at home. Collaboration between families and schools is essential in sustaining the attitudes and behaviours learned in the classroom.
5. **Targeted Interventions for Vulnerable Groups:** Since public-school pupils exhibited lower levels of knowledge and positive attitudes, tailored programs such as hygiene clubs, peer-learning activities, and school health campaigns should be introduced to address their specific needs.
6. **Regular Monitoring and Evaluation:** Education authorities should implement periodic assessments to monitor hygiene knowledge and practices among pupils. This will help identify emerging gaps and guide the continuous improvement of hygiene-promoting initiatives.
7. **Policy Support and Multi-sectoral Collaboration:** Effective hygiene promotion requires coordinated efforts among the Ministries of Education, Health, community organizations, and development partners. Integrating hygiene promotion into broader school health policies will ensure sustainability and long-term impact.

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Ethical Approval: We obtained both written and oral informed consent from our institutions and all participants prior to their involvement in the study. Additional informed consent was secured from individuals whose identifying information appears in this manuscript.

Conflicts of Interest: The authors sincerely declare that there are no conflicts of interest associated with this study.

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