Review Article

KNOWLEDGE OF PERSONAL HYGIENE AND OCCURRENCE OF FOOD AND WATER BORNE INFECTIONS IN SELECTED PUBLIC PRIMARY SCHOOLS IN ABA NORTH LGA, ABIA STATE

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Abstract

Background: The persistent occurrence of illnesses linked to contaminated food and unsafe water among school-aged children underscores the importance of understanding personal cleanliness, preventive behaviours and the conditions that shape hygiene practices. These concerns warrant investigation among pupils attending public primary schools in Aba North Local Government Area, Abia State, Nigeria. **Objective:** This study examined pupils' understanding of personal hygiene, identified the underlying factors shaping their awareness and everyday practices, and investigated the statistical relationships between the study variables and reported infection occurrence. **Methods:** The investigation adopted a descriptive cross-sectional research design involving children aged 6–12 years enrolled in selected government-owned primary schools. Respondents were recruited through a multistage sampling procedure, while information was obtained using a structured questionnaire administered by trained interviewers. From an initial sample of 405 pupils, 372 valid responses, representing 91.9%, were retained for analysis. Data were summarised using frequency distributions, percentages and mean scores, while Spearman's rank-order correlation was applied to examine relationships among the variables. **Results:** Responses across the five items assessing personal hygiene awareness showed affirmative proportions ranging from 67.2% to 75.3%, yielding an average of 70.4%. School-based instruction and parental reinforcement were each acknowledged by 80.6% of respondents. Concerning environmental provisions, 72.6% indicated sufficient availability of water and soap within their schools, whereas 67.2% reported access to properly maintained toilet facilities. Nevertheless, 45.7% experienced difficulties observing appropriate hygiene routines owing to inadequate resources within their households. Inferential analysis established a statistically significant relationship between pupils' hygiene knowledge and infection occurrence (Spearman's rho = 0.685, $p < 0.001$). A further significant association was identified between the composite socio-demographic measure and hygiene knowledge and practices (rho = 0.590, $p < 0.001$).
Conclusion: The findings suggest that, despite relatively widespread familiarity with fundamental hygiene principles, considerable deficiencies in pupils' understanding remain. Unequal access to sanitation infrastructure and essential household supplies also presents challenges to maintaining appropriate preventive behaviours. Accordingly, greater emphasis should be placed on comprehensive hygiene instruction, improved provision of potable water and sanitation materials in schools, and stronger collaboration between parents and educational institutions. As the investigation employed a cross-sectional design, the identified relationships establish statistical associations rather than causal effects.

Keywords: Personal hygiene; food-borne infections; water-borne infections; primary school pupils; school sanitation.

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INTRODUCTION

Food and water-borne infections are a significant public health challenge in developing countries, where inadequate sanitation and unsafe drinking water contribute to a high burden of disease. In Nigeria, infections such as cholera, typhoid fever and diarrhoeal diseases contribute to morbidity and mortality, especially among young children[1]. Globally, an estimated 443,832 children under five years die each year from diarrhoea, with most deaths in sub-Saharan Africa and Southern Asia[2]. Poor sanitation, limited access to clean water and inadequate hygiene behaviours, such as improper handwashing, sustain transmission in communities and schools[3]. Primary school children, who share communal environments and have developing immune systems, are at particular risk [4], and hygiene education and access to safe

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drinking water reduce the burden[5].

Aba North LGA, Abia State, has a diverse population with varying access to clean water and sanitation , and urban growth has strained infrastructure and waste management, which contributes to environmental contamination and water-borne disease (Centers for Disease Control and Prevention, 2022). Many households rely on shared or inadequate latrines, which increases the risk of faecal–oral transmission [6]. Schools can reach many children and their families, and integrating hygiene education into the curriculum can improve behaviour [7]. Handwashing with soap at key times, such as before eating and after using the toilet, improves hygiene practice among school children [8], and structured teaching programmes increase children's hygiene knowledge[9].

Despite this evidence, little is known about the hygiene knowledge and practices of primary school pupils in Aba North LGA. Existing studies often concern urban centres or broad regions and overlook local factors that shape behaviour in specific communities and schools. This study assessed pupils' knowledge of personal hygiene in selected public primary schools and the factors associated with hygiene knowledge and practice, and tested two hypotheses: H01, that there is no significant relationship between knowledge of personal hygiene and the occurrence of food and water-borne infections; and H02, that there is no significant relationship between socio-demographic factors and the knowledge and practice of personal hygiene.

Methods and Materials

Design, setting and participants

A cross-sectional descriptive survey was conducted in selected public primary schools in Aba North LGA, Abia State, Nigeria, among pupils aged 6 to 12 years.

Sample size and sampling

The sample size was calculated with Cochran's formula, which gave 405 pupils. A multistage sampling technique was used to select schools and pupils [state each stage: how schools were selected, how many schools, how classes and pupils were chosen]. Of the 405 pupils sampled, 372 questionnaires were analysed (91.9%)

Instrument and variables

A structured questionnaire was administered by an interviewer during school hours in the classroom. The questions were read aloud and explained as needed, and responses were anonymous. Knowledge of personal hygiene was assessed with five statements answered true, false or neutral. Factors influencing hygiene knowledge and practice were assessed with six statements rated on a five-point scale from strongly agree (5) to strongly disagree (1).

Data analysis

Frequencies and percentages were used for the knowledge statements. For the six five-point statements, means and standard deviations were recalculated from the response counts. The relationships tested in H01 and H02 were examined with Spearman's rank correlation, with $p < 0.05$ taken as significant.

Results

Respondent characteristics

Table 1 shows the 372 respondents analysed. Nearly half (48.4%) were aged 9 to 10 years, 27.4% were aged 11 to 12 years and 24.2% were aged 6 to 8 years. Slightly more than half were boys (53.8%). The classes were fairly evenly represented, from 13.4% in Primary 1 to 19.4% in Primary 4.

Table 1:Socio-demographic characteristics of the respondents (N = 372)

Characteristic	n	%
Age group (years)		
6–8	90	24.2
9–10	180	48.4
11–12	102	27.4
Gender		
Male	200	53.8
Female	172	46.2
Class		
Primary 1	50	13.4
Primary 2	60	16.1
Primary 3	70	18.8
Primary 4	72	19.4
Primary 5	60	16.1
Primary 6	60	16.1

Note. Percentages are of the 372 respondents analysed.

Knowledge of personal hygiene

Table 2 shows the responses to the five knowledge statements. Between 67.2% and 75.3% of pupils answered "true" to each. Washing hands after using the toilet and taking a bath daily were the best known (75.3% each). Washing hands before eating, brushing the teeth twice a day and wearing clean clothes were each answered "true" by 67.2%, so no one of them stands out as the least known. Across all statements, 70.4% of responses were "true", 13.4% "false" and 16.1% "neutral"; between a quarter and a third of pupils therefore did not give the expected answer on any given item.

Table 2: Pupils' responses to the personal hygiene knowledge statements (N = 372)

Statement	True, n (%)	False, n (%)	Neutral, n (%)
Washing hands before eating is important for good health	250 (67.2)	62 (16.7)	60 (16.1)
Brushing your teeth twice a day is necessary for good health	250 (67.2)	52 (14.0)	70 (18.8)
Taking a bath daily helps to keep you clean	280 (75.3)	42 (11.3)	50 (13.4)
Washing hands after using the toilet is important for good health	280 (75.3)	42 (11.3)	50 (13.4)
Wearing clean clothes is important for maintaining good health	250 (67.2)	52 (14.0)	70 (18.8)
All five statements	**1,310 (70.4)**	**250 (13.4)**	**300 (16.1)**

Note. Percentages are of the 372 respondents. The mean and standard deviation originally reported for these items could not be reproduced from the counts and have been removed.

Factors influencing hygiene knowledge and practice

Table 3 shows the responses to the six statements on factors. Most pupils agreed that their school teaches personal hygiene (80.6%) and that their parents or guardians encourage good hygiene (80.6%). Agreement was lower for having enough soap and water at school (72.6%) and for posters reminding pupils to wash their hands (72.6%), and lowest for clean toilet facilities at school (67.2%); one in six pupils (16.7%) disagreed that the school toilets were clean. Almost half (45.7%) said that lack of resources at home made good hygiene difficult, 27.4% disagreed, and 26.9% were neutral.

Table 3: Pupils' views on factors influencing hygiene knowledge and practice (N = 372)

Statement	SA	A	N	D	SD	Agree (%)	Mean	SD
My school teaches us about the importance of personal hygiene	180	120	40	20	12	80.6	4.17	1.03
My parents or guardians encourage me to practise good personal hygiene	190	110	40	22	10	80.6	4.20	1.03
I have enough soap and water at school to wash my hands	150	120	50	30	22	72.6	3.93	1.18
My school provides clean toilet facilities	140	110	60	40	22	67.2	3.82	1.21
There are posters in my school that remind us to wash our hands	160	110	50	30	22	72.6	3.96	1.19
I find it difficult to practise good hygiene because of a lack of resources at home	90	80	100	60	42	45.7	3.31	1.31

Note. SA = strongly agree, A = agree, N = neutral, D = disagree, SD = strongly disagree. Agree = SA plus A. Means and standard deviations are recalculated from the counts and differ from those in the original paper (for example, 4.17 instead of 4.10 for the first statement and 3.31 instead of 3.00 for the last).

Test of hypotheses

H01: Spearman's rho between knowledge level and infection occurrence was 0.685 ($n = 372$, $p < 0.001$), so H01 was rejected. As printed, a positive coefficient means that higher knowledge scores went with higher infection-occurrence scores.

H02: Spearman's rho between the socio-demographic composite and the knowledge-and-practice composite was 0.590 ($n = 372$, $p < 0.001$), so H02 was rejected.

Discussion

Knowledge of personal hygiene

Most pupils answered the five knowledge statements as expected, with 67.2% to 75.3% answering "true", which suggests a reasonable awareness of basic hygiene. Even so, between a quarter and a third of pupils on each item answered false or neutral, so the knowledge is not universal and further hygiene education is warranted. Chowdhury et al. (2024) found that although many students were aware of hygiene practices, access to clean water and parental influence shaped actual behaviour, and Kamalakannan and Narayan (2022) linked differences in knowledge to socio-economic conditions and educational interventions[10,11]Handwashing after using the toilet and daily bathing were the best known here (75.3% each), in line with studies that emphasise the importance of handwashing[12,13]. Ferdousi and Hannan reported that many pupils who valued handwashing lacked knowledge of the correct procedure, and Neupane et al. (2024) suggested that

such gaps are more evident in rural areas where behaviours are not reinforced. The present survey asked only whether handwashing is important, not whether the pupils knew or used the correct technique, so it cannot show whether similar gaps exist in Aba North.

Washing hands before eating, brushing the teeth twice a day and wearing clean clothes were each answered "true" by 67.2%. Limited access to clean water and household finances can restrict clothing hygiene ([Odonkor et al., 2019]), and many pupils acknowledge oral hygiene without brushing as recommended (Sinurat & Barus, 2023), but this survey did not collect data on those barriers and cannot confirm them as explanations.

Factors in the school and home environment

Most pupils reported hygiene teaching at school (80.6%) and encouragement at home (80.6%), which are favourable conditions. School facilities were less consistent: a third of pupils (32.8%) did not agree that their school toilets were clean, and over a quarter (27.4%) did not agree that they had enough soap and water or that posters were displayed. Gupta and Anand (2023) found that water, sanitation and hygiene facilities can enable or impede handwashing at school, which suggests that these gaps may limit practice even where knowledge is good. At home, 45.7% reported that lack of resources made good hygiene difficult. This is consistent with the view that home and school environments together shape hygiene practice, although the present data do not allow the contribution of each to be separated.[8,14]

Associations with infection and socio-demographic factors

Knowledge level and infection occurrence were strongly correlated (rho = 0.685), and so were the socio-demographic composite and knowledge and practice (rho = 0.590). In a cross-sectional survey these coefficients describe association only. They do not show that knowledge prevents or causes infection, and the interpretation of the first depends on how infection occurrence was coded [to be confirmed]. If the coding is such that a higher score means more infection, the result suggests that pupils with more hygiene knowledge reported more infections, which would be consistent with studies reporting that high knowledge does not always translate into hygienic behaviour (Nwadiuto et al., 2023) or with reverse causation, in which pupils who have been ill learn more about hygiene. If the coding is the reverse, the result agrees with the expectation that knowledge protects. Either way, structured interventions that move from knowledge to behaviour (Naik et al., 2022) and engagement of parents (Afemikhe & Afemikhe, 2023) remain relevant.

Strengths and limitations

The survey covered pupils across all six primary classes and gave a response of 91.9% of those sampled. Its limitations are as follows. Knowledge was assessed with five items, and pupils may have answered what they believed was expected. The survey did not measure hygiene practice directly in the tables presented, so the gap between knowledge and practice cannot be quantified from these results. Infection occurrence was reported by young children, and its measurement and recall period [to be described] may affect accuracy. The socio-demographic composite is not defined. The design is cross-sectional, so the direction of association cannot be established. Only selected public schools were included, so the findings cannot be generalised to all schools in Aba North LGA.

Conclusion

Pupils in the selected public primary schools in Aba North LGA showed reasonable knowledge of basic personal hygiene, but a quarter to a third answered each item otherwise, and school sanitation facilities and home resources were uneven. Knowledge and socio-demographic factors were associated with infection occurrence and with hygiene knowledge and practice respectively, but these associations are cross-sectional and the first requires confirmation of coding before its direction can be stated. The results support a combined approach of hygiene education, behavioural reinforcement and improved school facilities.

Recommendation

Based on these findings, the authors recommend that: (a) hygiene education with practical skills be integrated into the primary school curriculum; (b) school principals and teachers organise supervised hygiene routines and peer-led campaigns, with particular attention to handwashing before eating and clean clothing; (c) parents and community leaders be engaged through workshops that reinforce hygiene at home and address resource constraints; (d) education and health authorities ensure that schools have adequate water, soap and clean toilets, with regular assessment; and (e) further studies measure hygiene practice and infection directly, using defined and validated measures.

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Conflicts of interest

The authors declare no conflicts of interest related to this study.

Use of AI assisted technology for manuscript preparation

The authors confirm that AI assisted technology was not used for manuscript preparation.

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