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POLICY-TO-PRACTICE GAPS IN SCHOOL HEALTH, WATER AND SANITATION: EVIDENCE FROM NIGERIA

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ABSTRACT

Schools can support adolescent health in ways that extend well beyond classroom teaching. This study examined how selected elements of Nigeria's National School Health Policy were being implemented in secondary schools in Pankshin, Mangu and Kanke Local Government Areas (LGAs) of Plateau State. The assessment covered school health services, water, sanitation and hygiene (WASH), infrastructure and first-aid capacity. A descriptive, cross-sectional concurrent mixed-methods design was used in 10 schools, involving 200 students, 30 educators and 10 principals. Data were gathered through a questionnaire, an observation checklist and key-informant interviews. Analysis involved descriptive statistics, chi-square tests and thematic analysis. Five schools (50.0%) had on-site boreholes, while three (30.0%) had functional sickbays and two (20.0%) had trained first-aid officers. Gender-segregated toilets were available in five schools, but none met the study's benchmark of one female toilet per 25 students. Only two schools (20.0%) had functional handwashing facilities supplied with soap. The differences tested across the three LGAs were not statistically significant. Principals described unpredictable funding, limited access to trained personnel, weaknesses in emergency response and dependence on community contributions as barriers to implementation. Overall, the findings point to a gap between policy expectations and conditions observed in the participating schools. Addressing it will require reliable funding, improved WASH facilities, first-aid training, adequate staffing and regular monitoring.

KEYWORDS: *first aid, Nigeria, policy-to-practice gap, school health, WASH, Health Education, Pankshin*

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1. INTRODUCTION

1.1 BACKGROUND

Adolescence involves important physical, psychological, social and behavioural changes. During this period, young people develop habits related to hygiene, seeking health care and managing risk, which may affect their health later in life [1,2]. Since students spend a considerable part of their formative years at school, schools can contribute to health promotion, disease prevention, safety and access to support [3].

The Health-Promoting Schools approach treats health as a whole-school responsibility rather than a subject taught only in the classroom. The World Health Organization (WHO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) describe this approach as integrating health into school governance, the curriculum, the physical and social environment, health services and partnerships with families and communities [4,5]. Reviews have reported benefits for some student outcomes, although implementation and the quality of available evidence vary across studies [6–9].

This approach is particularly relevant in low- and middle-income settings, where students may learn about healthy practices without having the facilities needed to put that knowledge into practice. For instance, advice about handwashing has limited practical value when water and soap are unavailable [10,11]. Similarly, health lessons cannot replace a functioning sickbay, trained first-aid personnel, clear emergency procedures or a reliable referral pathway.

School health services connect the education and health sectors. WHO guidance includes services delivered by health workers in schools or through external health facilities, such as health assessments, preventive care, health promotion, first aid, referral and follow-up [12]. These services depend on trained personnel, supplies, clear procedures and links with the wider health system. For that reason, this study distinguishes the presence of a sickbay from the availability of a functioning school health service.

Water, sanitation and hygiene (WASH) are also central to a safe school environment. Reliable water supports drinking and personal hygiene; adequate sanitation protects privacy and helps limit environmental contamination; and accessible handwashing facilities make routine hygiene possible [10]. Gender-responsive sanitation involves more than separating toilets for boys and girls. Facilities must also provide sufficient capacity, privacy, safety, cleanliness and maintenance. Research in Nigeria and a recent national situation analysis have documented shortcomings in school sanitation, student-to-toilet ratios and the provision of handwashing facilities and soap [13,14].

Nigeria's National School Health Policy sets out four main components: health instruction, school health services, a healthful school environment and school–community relationships [15]. However, having a policy in place does not by itself mean that its provisions are being implemented consistently in schools [16].

1.2 THEORETICAL FRAMEWORK

This study draws on Bronfenbrenner's Ecological Systems Theory [17], which explains development through interactions between individuals and the environments around them. In the school-health context, the microsystem includes classrooms, teachers, peers, school rules and the facilities students use. The mesosystem includes relationships among schools, families, Parent-Teacher Associations (PTAs), communities and nearby health facilities. The exosystem includes decisions made by education authorities, local governments and health-system managers, particularly those concerning staffing and funding. The macrosystem includes national policy and wider socioeconomic conditions. The chronosystem highlights that implementation changes over time rather than occurring once and remaining fixed. This framework helps situate observed school conditions within wider institutional and community arrangements. Because the theory does not specify the direction or strength of policy-implementation relationships and was not designed specifically for implementation research, the study uses defined, observable indicators and combines quantitative findings with principals' accounts.

1.3 STUDY AIM AND RESEARCH QUESTIONS

The study examined the extent to which expectations in school-health policy were reflected in observable facilities, services, staffing and school practices. A functioning school health system depends on more than health lessons: it also requires safe water, adequate sanitation, handwashing facilities, first-aid capacity, trained personnel, emergency and referral procedures, funding, monitoring and community engagement. The study therefore assessed school health services, WASH, physical infrastructure and first-aid capacity in selected secondary schools in Pankshin, Mangu and Kanke LGAs of Plateau State. It addressed five questions: (1) To what extent were selected school-health requirements implemented? (2) What was the condition of school health services and WASH infrastructure? (3) What proportion of schools had functional sickbays and trained first-aid personnel? (4) Were selected indicators significantly different across the three LGAs? (5) What institutional barriers affected implementation?

2. METHODS

2.1 STUDY DESIGN AND SETTING

The study used a descriptive, cross-sectional concurrent mixed-methods design. The quantitative component assessed school-health implementation and infrastructure, while the qualitative component explored principals' experiences and perceived barriers. Fieldwork took place in Pankshin, Mangu and Kanke LGAs of Plateau State, Nigeria.

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2.2 PARTICIPANTS AND SAMPLING

Participants were senior secondary school students, health/science educators and school principals. Ten schools took part: four in Pankshin, three in Mangu and three in Kanke. The sample comprised 200 students, 30 educators and 10 principals. To protect school identities, the schools were coded P1–P4 for Pankshin, M1–M3 for Mangu and K1–K3 for Kanke.

2.3 DATA COLLECTION INSTRUMENTS

Three instruments were used: the School Health Observational Checklist (SHOC), the School Health Implementation Questionnaire (SHIQ) and a key-informant interview guide. The SHIQ used a four-point Likert scale. The SHOC recorded WASH, sickbay, first-aid and related infrastructure against benchmarks adopted for this study. Reported Cronbach's alpha coefficients for selected SHIQ domains were 0.81, 0.78 and 0.84.

2.4 DATA COLLECTION PROCEDURE

Researchers used the observational checklist to assess conditions directly at each school. Questionnaires were administered to the selected students and educators, and semi-structured interviews were conducted with all 10 principals.

2.5 DATA ANALYSIS

Quantitative data were analysed in IBM SPSS Statistics version 26.0. The analysis included frequencies, percentages, means and standard deviations. Chi-square tests of independence were used to examine selected differences among the LGAs, with statistical significance set at $\alpha = 0.05$. Interview responses were analysed thematically.

2.6 ETHICAL CONSIDERATIONS

Ethical approval was obtained from the relevant institutional and education authorities. Participation was voluntary. Informed consent procedures were followed; in addition, Ethical approval was gotten from the Plateau State Ministry of Health (Research and ethics). School names were replaced with codes to protect their identities.

3. RESULTS

3.1 CHARACTERISTICS OF SCHOOLS AND PARTICIPANTS

The study included 10 secondary schools: four in Pankshin (40.0%) and three each in Mangu and Kanke (30.0% each). Six schools were public, while four were private or mission schools. Among the 200 students, 102 (51.0%) were female and 98 (49.0%) were male. Of the 30 educators, 11 (36.7%) were health education specialists and 19 (63.3%) were general science teachers (Table 1).

3.2 INFRASTRUCTURE AUDIT

The school-level audit is summarised in Table 2. The manuscript records on-site boreholes at P1, P3, P4, M3 and K3; the other schools relied on off-site wells, streams, rainwater harvesting or an unprotected well. Functional sickbays were recorded at P1, P3 and M3. Functional handwashing facilities with soap were recorded only at P3 and M3. Female toilet-to-student ratios ranged from 1:40 to 1:160, meaning that none of the schools met the study benchmark of 1:25.

3.3 COMPLIANCE WITH INFRASTRUCTURE INDICATORS

Table 3 summarises compliance with the study benchmarks. Five schools (50.0%) were recorded as having on-site boreholes, and five (50.0%) had separate toilets for male and female students. However, no school met the benchmark of one female toilet per 25 students. The median female toilet-to-student ratio was 1:115 and the reported mean was 1:105. Three schools (30.0%) had functional sickbays, two (20.0%) had trained first-aid officers and two (20.0%) had functional handwashing stations with soap.

3.4 DIFFERENCES BY LOCAL GOVERNMENT AREA

The comparisons did not show statistically significant differences among the three LGAs for the selected indicators (Table 4). Year-round safe water was recorded in all four Pankshin schools and in one of the three schools in each of Mangu and Kanke; this difference was not statistically significant ($\chi^2(2) = 4.444$, $p = 0.108$). The differences for functional sickbays ($\chi^2(2) = 2.857$, $p = 0.239$) and soap availability at sanitation sites ($\chi^2(2) = 3.750$, $p = 0.153$) were also not statistically significant.

3.5 QUALITATIVE FINDINGS

The 10 principal interviews yielded three main themes. Inadequate and unpredictable funding: Principals described having limited dedicated funds for maintaining facilities and purchasing emergency supplies. Some reported that teachers had used their own money to transport students to health facilities in urgent situations. These accounts suggest that some aspects of school health depended on ad hoc arrangements rather than reliable funding. Limited trained personnel: Schools often relied on general science teachers and health education staff to support health-related activities. Some principals reported that teachers had limited training in first aid, triage and emergency response. This points to a distinction between the ability to teach health topics and the capacity to manage health incidents. Reliance on PTA and community contributions: Principals said that PTAs and community members had helped provide infrastructure, including sanitation facilities. Such support can be valuable, but depending on voluntary contributions to maintain essential facilities may create sustainability and equity concerns.

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4. DISCUSSION

4.1 SCHOOL HEALTH SERVICE CAPACITY

Functional sickbays were available in three of the 10 schools (30.0%), while trained first-aid officers were reported in two (20.0%). These findings suggest that the capacity to respond to students' health needs and emergencies was limited in the schools assessed. They also support the distinction between having a room designated as a sickbay and providing a functioning school health service, which requires personnel, supplies, procedures and referral arrangements [12]. Principals' accounts of teachers paying for emergency transport further suggest that staff sometimes had to fill gaps in formal response arrangements.

4.2 WASH DEFICITS BEYOND WATER AVAILABILITY

The audit suggests that the presence of a water source did not necessarily mean that schools had adequate WASH facilities. Although half of the schools were recorded as having on-site boreholes, only two (20.0%) had functional handwashing facilities with soap. In addition, none met the study's female toilet-to-student benchmark of 1:25. Separate toilets for male and female students were recorded in half of the schools, illustrating that separation alone does not establish adequate capacity or quality. These findings are consistent with reports of sanitation and handwashing challenges in Nigerian schools [13,14] and with international guidance that emphasises access to hygiene facilities, not knowledge alone [10,11].

4.3 DIFFERENCES AMONG LOCAL GOVERNMENT AREAS

Pankshin had higher recorded availability for some indicators, but none of the three comparisons reached statistical significance. This should not be taken as proof that conditions were the same across the LGAs. With only 10 schools in the analysis, the study had limited ability to identify differences.

4.4 FUNDING, PERSONNEL AND COMMUNITY PARTICIPATION

The interview findings offer possible explanations for the infrastructure gaps observed. When funding is insufficient or unpredictable, schools may struggle to maintain water systems, purchase soap, equip sickbays and replenish emergency supplies. The findings should therefore not be interpreted solely as failures at school level. Teachers have an important role in health promotion, but teaching health education is not equivalent to having the practical skills required for emergency response. Since trained first-aid officers were reported in only two schools, targeted training is warranted. PTA and community support reflects the value of partnership in a whole-school approach [4,5], but essential school-health facilities should not depend mainly on voluntary contributions.

4.5 THE POLICY-TO-PRACTICE GAP

The findings indicate a gap between Nigeria's National School Health Policy [15] and the facilities and personnel observed in the participating schools. Bronfenbrenner's Ecological Systems Theory [17] helps interpret this gap across several levels: students encounter the immediate effects of inadequate WASH and first-aid facilities; schools rely on families, PTAs, communities and health facilities; staffing and funding decisions are made by wider institutions; and national policy establishes expectations that may not be matched by resources. The findings therefore suggest that implementation is shaped by connected institutional and community factors, rather than by the actions of individual schools alone.

4.6 RECOMMENDATIONS

Education authorities should prioritise schools without reliable water and functional handwashing facilities. This support should include soap, maintenance plans and arrangements for continued access to water, not only the construction of water sources. Additional sanitation facilities should be directed first to schools with the highest female toilet-to-student ratios. Each school should have at least one staff member with recognised first-aid and emergency-response training. Schools without functional sickbays should be assessed for suitable space, beds, supplies, staffing and referral arrangements. Formal links with nearby primary healthcare centres should support emergency referrals, screening, preventive services, health education and follow-up. Authorities should provide predictable funding for school-health infrastructure, WASH maintenance, first-aid supplies and emergencies; PTA and community contributions should supplement, not replace, public responsibility. Continuing professional development should cover first aid, emergency response, WASH, adolescent health and referral procedures. Routine monitoring should record water availability, sanitation, handwashing, soap, sickbay functionality, first-aid capacity and maintenance. Since the observed LGA differences were not statistically significant, decisions should be based on documented school-level needs rather than assumptions that one LGA is uniformly worse than another.

4.7 LIMITATIONS

This study covered only 10 schools in three LGAs, so the findings should not be generalised to all schools in Plateau State or Nigeria. Its cross-sectional design provides a snapshot and cannot establish how conditions change over time. Some information was self-reported and may be affected by reporting bias, although direct observation provided an independent assessment of physical facilities. The small number of schools in each LGA also limits the power and reliability of the chi-square comparisons. Combining observed conditions with principals' accounts helped place the quantitative findings in context. Further studies involving more schools and states, preferably with repeated assessments over time, are needed.

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5. CONCLUSION

In the schools assessed, national school-health policy was not consistently reflected in functioning school-level facilities and services. Access to a water source did not ensure adequate sanitation or handwashing: the main gaps included toilet capacity, soap, trained first-aid personnel and functional sickbays. Principals associated these problems with unpredictable funding, limited training and reliance on voluntary contributions. Strengthening implementation will require dependable financing, routine monitoring and closer coordination between education and health authorities, with support directed according to each school's documented needs.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

Study data may be made available upon reasonable request, subject to applicable ethical and institutional requirements.

AUTHOR CONTRIBUTIONS

Philip Joseph Dangbin: conceptualization, supervision, methodological oversight, review and editing. Ezekiel Kumnah Banmang: methodological contribution, review and editing. KUMSHIN JOEL ASHINNAN, data-related contribution, review and editing. Erima Adima Tongnan: data-related contribution, review and editing. Emmanuel Owoicho Audu: conceptualization, methodology, data analysis, interpretation, original manuscript preparation, review and editing. Contributions for Ajiji Ama Markus oversees all data assistance, ethical clearance and respondents consent management.

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TABLES

Table 1: Characteristics of sampled schools and participants

Variable	Category	n	%
Local Government Area (schools)	Pankshin	4	40.0
	Mangu	3	30.0
	Kanke	3	30.0
School ownership (schools)	Public	6	60.0
	Private or mission	4	40.0
Sex of students (N = 200)	Male	98	49.0
	Female	102	51.0
Educators (N = 30)	Health education specialists	11	36.7
	General science teachers	19	63.3

Percentages are calculated within each variable (10 schools, 200 students or 30 educators).

Table 2: Institutional infrastructure audit across sampled schools

School	LGA	Ownership	Water source	Functional sickbay	Female toilet-to-student ratio	Handwashing facility
P1	Pankshin	Public	On-site borehole	Available	1:85	Present, no soap
P2	Pankshin	Public	Off-site well	Absent	1:120	Absent
P3	Pankshin	Private	On-site borehole	Available	1:40	Present, with soap
P4	Pankshin	Mission	On-site borehole	Absent	1:65	Absent
M1	Mangu	Public	Stream/surface water	Absent	1:140	Absent
M2	Mangu	Public	Rainwater harvesting	Absent	1:130	Absent
M3	Mangu	Private	On-site borehole	Available	1:50	Present, with soap
K1	Kanke	Public	Off-site stream	Absent	1:160	Absent
K2	Kanke	Public	Unprotected well	Absent	1:150	Absent
K3	Kanke	Mission	On-site borehole	Absent	1:110	Absent

LGA = Local Government Area. Ratios express female toilets to students (1:n).

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Table 3: Aggregate compliance with school health infrastructure indicators

Infrastructure indicator	Benchmark adopted for the study	Compliant schools	Compliance (%)
Potable water source	Functional on-site borehole	5/10	50.0
Functional sickbay	Dedicated room with bed and first-aid provision	3/10	30.0
Trained first-aid officer	At least one trained officer per school	2/10	20.0
Gender-segregated toilets	Separate facilities for males and females	5/10	50.0
Female toilet-to-student ratio	1:25	0/10	0.0
Functional handwashing station with soap	Functional station with soap near toilets	2/10	20.0

Female toilet-to-student ratio across the 10 schools: median 1:115, mean 1:105 (benchmark 1:25).

Table 4: Chi-square comparison of selected infrastructure indicators by Local Government Area

Indicator	Pankshin (n = 4)	Mangu (n = 3)	Kanke (n = 3)	χ^2	p
Functional sickbay	2 (50.0)	1 (33.3)	0 (0.0)	2.857	0.239
Safe water available year-round	4 (100.0)	1 (33.3)	1 (33.3)	4.444	0.108
Soap available at sanitation sites	2 (50.0)	0 (0.0)	0 (0.0)	3.750	0.153

Values are the number (%) of schools with the indicator. Pearson chi-square test, df = 2.

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