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Original Article

School Health Intervention: Water, Sanitation, and Hygiene (WASH) in Schools (WinS) Program in Public Schools of the National Capital Region, Philippines

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Abstract

Background: The program of Water, Sanitation, and Hygiene (WASH) in Schools (WinS), implemented by the Department of Education, supports the United Nations (UN) Sustainable Development Goals, particularly Goal 6 (Clean Water and Sanitation) and Goal 3 (Good Health and Well-being). The present study assessed the extent of implementation of WinS in public schools in the National Capital Region (NCR), Philippines, identified the most challenging program elements, and explored the associations with demographic characteristics of implementers.

Methods: A descriptive cross-sectional survey was conducted from March to May 2023 among 706 School WinS Coordinators (SWCs) across public elementary and secondary schools in National Capital Region (NCR). Data were collected using a modified Department of Education WinS monitoring tool. Descriptive statistics and nonparametric tests (e.g., Chi-square) were used in SPSS version 26.

Results: The WinS program was rated as "implemented" (mean value=3.41), with Sanitation as the only "fully implemented" element (mean value=3.60). Deworming was the most difficult element and Funding Stability was the most complex domain. Significant differences were found based on implementer demographics. Age was associated with implementation ratings for Water, Sanitation, Hygiene, and Health Education (all $P \leq 0.001$). Position was linked to Water ($P=0.031$), Sanitation ($P=0.036$), Hygiene ($P=0.048$), and Deworming ($P=0.008$). Subject taught and grade level were also significantly related to some elements. Gender, educational attainment, and length of experience showed no significant associations.

Conclusions: While WinS implementation in NCR schools is generally positive, gaps remain in Deworming and Funding Stability. Tailoring support based on implementer demographics may improve program delivery.

Keywords: Water, Sanitation, Hygiene, School Health Services, Philippines

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1. Introduction

Schools are a strategic platform for advancing global development goals, particularly the United Nations 2030 Agenda, which emphasizes ensuring sustainable access to water and sanitation for all (1). Water, Sanitation, and Hygiene (WASH) interventions in schools have been shown to reduce health risks, improve nutrition and hydration, and promote practices such as regular handwashing (2, 3). Evidence from international studies also shows that inadequate WASH facilities contribute to absenteeism, particularly among girls, and increase vulnerability to diarrheal diseases and parasitic infections (4, 5). Beyond infectious disease prevention, WASH initiatives support child well-being, school attendance, and overall academic performance (6, 7). Similar trends were noted in a study from Iran, where rural schools lagged behind urban counterparts in oral health services and hygiene practices (8).

In the Philippines, the Department of Education launched the WASH in Schools (WinS) program in 2016 as a structured initiative to institutionalize hygiene and sanitation in public schools. The program outlines specific activities and indicators grouped under five key elements: Water, Sanitation, Hygiene, Deworming, and Health Education (9). These elements are further operationalized through the Three-Star Approach (TSA), a monitoring and evaluation framework that rates schools on a zero to three-star scale and provides benchmarks for progressive school improvement (10). Local studies in the Philippines highlighted both the potential and the challenges of WinS. For instance, school-based interventions have reduced diarrhea and improved malnutrition

and hydration outcomes (2, 3), but other reports underscored persistent inequities in compliance, particularly in resource-limited schools in both rural and urban-poor contexts (9, 11).

Similar hygiene and sanitation challenges exist in many developing countries. In Nigeria and Zambia, limited resources and weak maintenance systems hinder the sustainability of WASH interventions (1, 12), while schools in Kazakhstan report inadequate access to safe water and toilets, especially in rural areas (4). Systematic reviews confirmed that sustainability is threatened when programs are not fully integrated into national policies and rely heavily on external funding (7, 13). Environmental health audits in schools from Shiraz, Iran, similarly revealed infrastructural deficits that mirrored those in low- and middle-income country (LMIC) settings, particularly with regard to sanitation facilities (14). Moreover, Nelson and colleagues emphasized that meaningful community participation, through parents, school management committees, and local governments, is vital for ensuring program continuity and effectiveness (15).

Two critical but often overlooked elements of the WinS framework are deworming and health education. Deworming has been recognized as a cost-effective intervention for controlling soil-transmitted helminths. Surveillance in Rwanda confirmed the safety of praziquantel and albendazole among schoolchildren (16); yet, experiences from Bangladesh and Indonesia revealed implementation gaps, particularly when out-of-school children are excluded or when community coordination is weak (5, 17). Calls for integrated approaches, such as linking deworming with school meals, are growing as a way to support children's resilience and development (18).

Similarly, health education ensures that infrastructure translates into behavior change.

Peng and colleagues demonstrated that school-based food safety interventions can be effective in improving hygiene-related practices (19). Gholami Dastenaee and co-workers compared family- and school-based puberty education programs and found that institutional interventions had better behavioral outcomes (20). However, studies from Kenya and Zambia demonstrated gaps between curriculum content and actual practices in schools, raising concerns about program sustainability (6, 12). This reinforces arguments to embed WASH and health promotion more explicitly into school improvement and education policies (10). Gaps in health education delivery, particularly in low-resource settings, have been attributed to inconsistent training and inadequate institutional frameworks (21).

Despite the increasing global recognition of the importance of WASH, research on its implementation within the Philippine context remains limited. Few studies have systematically examined how School WinS Coordinators (SWCs), the focal persons responsible for program oversight, perceive implementation, identify challenges, and navigate barriers. While Philippine studies demonstrated clear health benefits of school-based WASH interventions (2, 3), systematic reviews highlighted that sustaining such programs remains a global challenge, particularly in relation to policy integration, community engagement, and long-term resourcing (7, 15). This gap underscores the need to investigate how demographic characteristics of SWCs may shape program delivery and perceptions of difficulty.

Guided by these concerns, this study aimed to assess the extent of WinS program implementation as perceived by SWCs, determine whether demographic characteristics are associated with implementation outcomes, identify which elements are perceived as most challenging, and examine whether demographic factors influence perceptions of the complexity and difficulty of the program.

2. Methods

2.1. Design

This study employed a descriptive cross-sectional survey design conducted from March to May 2023 to evaluate the implementation of the WinS program in public elementary and secondary schools across the National Capital Region (NCR), the most densely populated region in the Philippines.

2.2. Selection and Description of Participants

Participants were designated School WinS Coordinators (SWCs) from public schools. Each school had one assigned SWC, typically a school health and nutrition coordinator, science teacher, or school nurse, appointed by the school head in

accordance with DepEd Order No. 10, s. 2016. Inclusion criteria were official appointment as the WinS implementer for SY 2023 2024, at least one year of service in the role, completion of division level WinS orientation or training. Exclusion criteria included not being formally designated as an SWC, being newly appointed without training, or being on extended leave during data collection

2.3. Sample Size Determination

The sample size was calculated using the Raosoft Sample Size Calculator with a 95% confidence level, 50% response distribution, and 2% margin of error, based on the population of public schools in NCR (N=858). The minimum required sample was 619. A total of 706 valid responses were obtained, yielding an 82.3% response rate. A detailed breakdown of participating schools by division is provided in Supplementary File 1.

2.4. Data Collection and Measurements

Prior to data collection, the research instrument was reviewed by an expert panel from the Our Lady of Fatima University (OLFU), Graduate School, Valenzuela, Philippines. Ethics approval was secured in line with Philippine Health Research Ethics Review Board (PHREB) guidelines. Formal request letters were submitted to the DepEd Central and Regional Offices, followed by coordination with Schools Division Superintendents (SDS) and Division WinS Coordinators. Survey instruments and consent forms were distributed either online via QR code or on-site through printed forms, depending on school accessibility.

In the present study, we used a modified questionnaire based on the official monitoring tool developed by the Philippine Department of Education, as stipulated in DepEd Order No. 10, series of 2016, titled *Policy and Guidelines for the Comprehensive Water, Sanitation and Hygiene in Schools (WinS) Program*. The instrument was structured to capture comprehensive information across three major components.

The first section gathered demographic and professional background information of the School WinS Coordinators (SWCs), including their age, gender, highest educational attainment, current position, teaching subject, and grade level assignment.

The second section contained 41 items reflecting the core implementation indicators of the WinS program. These items were categorized into seven thematic domains: Water (6 indicators), Sanitation–Toilets (7), Sanitation–Waste Management (7), Sanitation–Food Safety (3), Hygiene (8), Deworming (3), and Health Education (7). For analytical purposes, the three sanitation subdomains were aggregated under the broader element of Sanitation.

Each indicator was rated using a 4-point Likert scale, with 1=*Not Implemented*, 2=*Partially Implemented*, 3=*Implemented*, and 4=*Fully Implemented*. Weighted mean scores for each domain were computed by multiplying the frequency of responses by their corresponding scale values, summing the products, and dividing by the total number of responses. The overall or grand mean was derived as the arithmetic average of the core element means, providing a composite measure of implementation level across schools.

The third section of the tool focused on perception-based rankings, where participants were asked to rank the five key WinS program elements and eight implementation-related domains according to perceived difficulty. A copy of the full questionnaire is provided as Supplementary File 2.

2.5. Procedure

Reliability analysis was performed using an initial subset of completed questionnaires that were submitted early during data collections. The instrument demonstrated strong internal consistency, with an overall Cronbach's alpha of 0.834. Domain-specific coefficients also indicated acceptable to excellent reliability: Water (0.814), Sanitation (0.887), Hygiene (0.720), Deworming (0.972), Health Education (0.882), and Challenges (0.898).

Content validity was confirmed through expert review by professionals in school health and education management. The instrument was adapted from the Department of Education's official WinS monitoring tool (DepEd Order No. 10, s. 2016), supporting its construct alignment with national standards.

2.6. Data Analysis

The collected data were analyzed using IBM SPSS Statistics version 26. Descriptive statistics,

including frequency, percentage, mean, and standard deviation, were used to summarize the demographic profile of respondents and the implementation levels of the WinS program. The weighted mean was calculated to interpret Likert-scale items across program domains (Water, Sanitation, Hygiene, Deworming, and Health Education).

To determine associations between demographic characteristics and WinS domain ratings, a series of nonparametric tests were employed due to non-normal distribution (confirmed via Kolmogorov–Smirnov and Shapiro–Wilk tests). Specifically, Chi-square tests were used to examine relationships between categorical variables (e.g., challenges experienced vs. age, gender, education, and role-related variables). Cramer's V coefficients were reported to indicate the strength of these associations, with statistical significance set at $P<0.05$.

For ordinal or non-normally distributed continuous variables, Spearman's rank-order correlation and nonparametric independent-sample tests (e.g., Mann–Whitney U, Kruskal–Wallis H) were applied to explore differences across groups such as gender, coordinator experience, and grade level taught. The internal consistency of the implementation scale was assessed using Cronbach's alpha. A significance level of $P<0.05$ was used throughout the research.

3. Results

The study participants were School WinS Coordinators (SWCs) from public schools across the National Capital Region. The age of the participants ranged from 21 to 65 years, with a majority being female (87.7%). In terms of educational attainment, 27.2% held a Master's degree, while 2.4% had completed Doctoral studies. Most of the participants (98.1%) were teachers, and only 13 out of 706 (1.8%) were allied health professionals, such as school nurses. Regarding tenure, 78.3% of the participants had more than one year of experience in implementing the WinS program.

According to the assessment provided by SWCs (Table 1), four of the five key program elements, including Water, Hygiene, Deworming, and Health Education, received an overall rating of "implemented," with weighted means (WM) of 3.31, 3.41, 3.30, and 3.42, respectively (SD=0.85, 0.76, 0.88, and 0.79). Notably, Sanitation was the only element rated as "fully implemented" (WM=3.60, SD=0.65). This category includes indicators related to toilet facilities, waste management, and food safety.

Significant differences in implementation scores across the five key WinS elements were observed based on several demographic variables of School WinS Coordinators (SWCs) (Table 2). Age was significantly associated with implementation scores for Water (P=<0.001), Sanitation (P=<0.001), Hygiene (P=<0.001), and Health Education (P=<0.001). Similarly, SWC position showed significant differences in Water (P=0.031), Sanitation (P=0.036), Hygiene (P=0.048), and Deworming (P=0.008) implementation ratings. Subject taught was significantly associated with Hygiene scores (P=0.002), while grade level assignment showed statistically significant associations with Water (P=0.009), Hygiene (P=0.001), and Deworming (P=0.004). In contrast, gender, highest educational attainment, and length of experience as a WinS Coordinator were

Table 1: Mean and Standard Deviation on the WinS implementation of SWCs

WinS Key Elements	Weighted Mean	Standard Deviation
Water	3.31	0.85
Sanitation (Toilet, Waste Management, Food Safety)	3.60	0.65
Hygiene	3.41	0.76
Deworming	3.30	0.88
Health Education	3.42	0.79
Grand Total Mean	3.41	0.79

SWCs: School WinS Coordinators; 1.00-1.49 Least Implemented, 1.50-2.49 Partially Implemented, 2.50-3.49 Implemented, 3.50-4.00 Fully Implemented. Each WinS key element represents the average of multiple indicators assessed on a 4-point scale (1=Not Implemented to 4=Fully Implemented). The Water element includes 6 indicators; Sanitation combines 3 subcomponents (7 indicators for Toilets, 7 for Waste Management, and 3 for Food Safety); Hygiene has 8 indicators; Deworming has 3; and Health Education has 7. All indicators were equally weighted. The reported weighted mean for each element reflects the arithmetic average of its indicators. The grand total mean is the average of the five key element means.

not significantly associated with differences in program implementation scores.

Additional correlation analysis using Spearman's rho showed low to moderate positive associations between certain demographic characteristics of schools and their corresponding WinS implementation scores. Age was positively correlated with Water (P=0.193, P<0.001), Sanitation (P=0.215, P<0.001), Hygiene (P=0.200, P<0.001), and Health Education (P=0.213, P<0.001). Coordinator position showed weak correlations with Deworming (P=0.123, P=0.008) and Water (ρ=0.093, P=0.031). Grade level assignment was also associated with Water (P=0.098, P=0.009), Hygiene (P=0.117, P=0.001), and Deworming (P=0.107, P=0.004). Other variables such as gender and education level did not show statistically significant correlations with implementation scores.

When asked to rank the key elements based on implementation difficulty (Table 3), SWCs identified Deworming as the most challenging, followed by Sanitation, Hygiene, Water, and Health Education, the latter being perceived as the least difficult. Regarding the eight contextualized domains of the WinS program (Table 4), Funding Stability emerged as the most difficult, followed by Partnerships, Environmental Support, Organizational Capacity, Program Evaluation, Program Adaptation, and Strategic Planning. Communications was rated as the least challenging domain.

Lastly, analysis of variance using Chi-square tests revealed no significant differences between the demographic profiles of SWCs and their rankings of the elements and domains of the WinS program in terms of perceived difficulty. P values ranged from 0.18 to 0.88, indicating broad similarity in perceived challenges across age, gender, education, position, subject taught, and grade level.

Descriptive results indicated that Deworming was most frequently ranked as the most challenging element (49%), followed by Sanitation (20%) and Water (16%). For the eight domains, Funding Stability was most frequently ranked highest in difficulty (45%), followed by Environmental Support (16%) and Partnerships (14%).

This suggests that while implementation scores varied across some demographics, overall perceptions of difficulty remained largely consistent.

4. Discussion

The present study examined how School WinS Coordinators (SWCs) in the National Capital Region perceived the implementation of the Department of Education's WASH in Schools (WinS) program, focusing on the performance of the WinS program elements and the demographic factors associated with their implementation. This contributes new evidence to the limited

Table 2: Correlation of demographic profile of SWCs and implementation of WinS key elements

SWC Demographic Characteristics	Implementation Scores for WinS Elements				
	Water	Sanitation	Hygiene	Deworming	Health Education
Age	V=0.16, P<0.001	V=0.09, P<0.001	V=0.09, P<0.001	V=0.05, P=0.36	V=0.12, P<0.001
Gender	V=0.08, P=0.62	V=0.03, P=0.12	V=0.03, P=0.30	V=0.07, P=0.23	V=0.03, P=0.64
Highest Educational Attainment	V=0.25, P=0.65	V=0.24, P=0.88	V=0.27, P=0.19	V=0.10, P=0.69	V=0.05, P=0.86
Position	V=0.12, P=0.03	V=0.10, P=0.04	V=0.14, P=0.05	V=0.21, P=0.01	V=0.18, P=0.12
Length of Experience as SWC	V=0.08, P=0.23	V=0.05, P=0.29	V=0.05, P=0.86	V=0.12, P=0.06	V=0.09, P=0.41
Handled Subject	V=0.05, P=0.72	V=0.07, P=0.55	V=0.30, P=0.00	V=0.09, P=0.37	V=0.11, P=0.54
Grade Level Assignment	V=0.20, P=0.01	V=0.20, P=0.08	V=0.15, P=0.00	V=0.21, P=0.00	V=0.17, P=0.39

SWCs: School WinS Coordinators; SWC Values are Cramer's V coefficients with corresponding P values from Chi-square tests. Statistical significance was set at P<0.05.

Table 3: Ranking according to the key elements of the WinS Program based on Difficulty level

Key Elements	1st Choice	%	2nd Choice	%	3rd Choice	%	4th Choice	%	5th Choice	%	Overall Ranking
Deworming	346	49	69	10	50	7	123	17	118	17	1st
Sanitation	144	20	237	34	195	28	99	14	31	4	2nd
Hygiene	58	8	180	25	237	34	185	26	47	7	3rd
Water	112	16	137	19	120	17	148	21	188	27	4th
Health Education	46	7	83	12	104	15	151	21	322	46	5th

Table 4: Ranking according to the eight domains of the WinS Program based on Difficulty level

Program Domains	1st	%	2nd	%	3rd	%	4th	%	5th	%	6th	%	7th	%	8th	%	Overall Ranking
Funding Stability	320	45	134	19	86	12	43	6	26	4	32	5	21	3	45	6	1st
Partnerships	98	14	169	24	170	24	109	15	68	10	45	6	31	4	15	2	2nd
Environmental Support	115	16	150	21	131	19	112	16	64	9	43	6	56	8	36	5	3rd
Organizational Capacity	53	8	84	12	121	17	177	25	108	15	75	11	53	8	35	5	4th
Program Evaluation	20	3	33	5	55	8	97	14	209	30	142	20	82	12	69	10	5th
Program Adaptation	33	5	39	6	73	10	61	9	99	14	223	32	107	15	71	10	6th
Strategic Planning	56	8	75	11	49	7	62	9	63	9	63	9	104	15	233	33	7th
Communications	11	2	22	3	21	3	45	6	69	10	83	12	252	36	202	29	8th

1st–8th=Ranking choices by SWCs. "%"=Percent of respondents choosing each rank

Southeast Asian literature on implementation-focused WASH research. Key findings revealed that Deworming was considered the most difficult element, while Funding Stability emerged as the most challenging domain. Additionally, SWCs' age, position, subject taught, and grade level assignment were significantly associated with implementation scores. These findings underscored how both structural limitations and implementer characteristics shape WinS outcomes, pointing to gaps in training, funding, and curriculum integration.

In the following sections, we explore these patterns in greater detail and situate our findings within the broader evidence base on school-based WASH implementation.

4.1. Demographics of the Program Implementers and WinS Implementation

The present study provided new insight into how specific SWC characteristics, such as teaching assignment in Filipino or Mother Tongue, are associated with stronger implementation outcomes. Earlier discussions of WASH integration in schools often emphasized science subjects as natural entry points for health content; however, our findings suggested that local-language instruction may also foster stronger engagement and closer alignment with student behavior. Higher implementation scores were observed among older SWCs, head teachers, and those working in elementary-level settings. These outcomes resonate with evidence from other contexts showing that structural and contextual disparities, such as differences between school types and available resources, shape how health programs are implemented and sustained (22).

However, weak prioritization of health initiatives by school leadership remains a documented barrier (15). Moreover, while educational attainment and tenure showed no significant correlation in this study, prior literature suggested these traits may still matter when accompanied by exposure to health content (20). Our findings also affirmed the importance of pedagogical experience and positional authority in sustaining school-based health programs, even among non-health professionals (12).

This section reinforces the growing body of evidence that teacher background, particularly their subject area, language of instruction, and grade-level assignment, can influence how WASH messages are conveyed and received. However, studies highlighted persistent gaps between what is formally included in curricula and what is actually delivered in classrooms (6), suggesting the need to reassess assumptions about how educational frameworks translate into practice. Other implementation strategies reported in the literature include assigning additional hygiene monitoring responsibilities to designated staff, strengthening community engagement, and increasing principal involvement (13, 15).

Beyond implementer characteristics, program-specific components also revealed uneven patterns of difficulty.

4.2. Deworming: The Most Difficult Element of the WinS program

The present study adds to global evidence that deworming remains one of the most logistically and behaviorally challenging WASH components, even in urban contexts. While its role in controlling soil-transmitted helminthiasis (STH) is well established (23), effective implementation depends heavily on child and parental awareness, drug acceptance,

and outreach to vulnerable groups such as out-of-school children (5).

The contribution of this study lies in its localized perspective, highlighting how policy adjustments that redirected deworming efforts toward high-stunting areas, combined with COVID-19 disruptions, resulted in interrupted deworming cycles even among better-resourced schools. Similar to findings elsewhere in ASEAN (17)Indonesian government has also adapted this strategy by launching the Ministry of Health (MoH, health staff shortages and reliance on teachers to administer medication have produced inconsistent outcomes.

These patterns highlight the urgent need for stronger cross-sector coordination and sustained community education, particularly in low-income urban areas where infections persist despite reported coverage.

4.3. Funding Stability: The Most Challenging Domain

Financial constraints further compound these implementation challenges. The identification of Funding Stability as the most difficult domain reinforces concerns raised in both Philippine and global reports (9, 13). This study extends that evidence by demonstrating how chronic underfunding undermines not only implementation quality but also long-term sustainability, even when basic infrastructure is already in place.

Our findings showed that reliance on ad hoc resources, parental contributions, donations, or short-term projects, creates a fragile foundation for program delivery.

A multi-stakeholder approach that engages local governments, school leaders, and community actors is therefore critical to establish protected, recurring funding streams. Embedding WinS into broader education sector planning, with dedicated line-item budgets and accountability mechanisms, will be key to moving beyond stopgap measures toward sustained impact.

4.4. Charting the Way Ahead for School Health and WASH Programs

The present study reaffirms that the effectiveness of school-based WASH programs depends not only on infrastructure but also on behavioral change, transparent data systems, and strategic policy alignment. Yet, persistent gaps in national monitoring limit visibility into rural and disadvantaged schools, weakening equity in program delivery. As highlighted in prior studies (13, 15), addressing these inequities requires a deliberate, equity-driven approach to data collection and planning.

In addition, fragmented program elements, such as health education, facility upkeep, and hygiene promotion, must be consolidated into a cohesive framework of shared accountability. Our findings strengthen the call to embed WASH directly into formal instruction and routine school management, ensuring that it is not relegated to an extracurricular activity but positioned as a core component of education and child well-being.

4.5. Health Education: Accessible Yet Underutilized

Although Health Education was perceived as the easiest WinS component to implement, this study highlights a disconnect between ease of delivery and lasting behavioral change. While implementers generally provide positive ratings, these perceptions may overlook underlying structural limitations. Inadequate curriculum integration and the absence of standardized IEC materials reduce opportunities for sustained hygiene practice within schools.

This aligns with concerns in the global literature, where WASH themes such as occasional handwashing lessons are often addressed episodically rather than embedded systematically into classroom instruction (10, 24). Similarly, Solhi and Saboohi noted that mental health and life skills education are frequently treated as supplementary, underscoring broader challenges in how health education is positioned within school systems (25).

Taken together, these findings suggested that what teachers find easy to teach may not translate into what students internalize. Clearer alignment between pedagogy, resources, and policy is needed to ensure that Health Education supports long-term behavioral outcomes rather than short-term compliance.

4.6. Limitations

While the present study provided important

insights into WinS implementation, certain limitations should be recognized. Reliance on self-reported data from School WinS Coordinators may have introduced social desirability or recall bias, particularly in assessing program elements. The cross-sectional design also limits causal interpretation, as observed associations between demographic traits and implementation scores reflect correlations rather than directional effects. The focus of the present study on public schools in the National Capital Region further restricted the generalizability to other regions or private institutions with different resource contexts. Also, this study assessed only perceptions of implementation difficulty rather than direct health or behavioral outcomes among students.

Despite these limitations, our findings highlighted valuable directions for both research and policy. Future studies should employ longitudinal or mixed-methods designs to unpack causal pathways and contextual barriers. Policymakers and education leaders should work toward stronger integration of WinS into curriculum planning and school funding frameworks, with emphasis on systematic training, monitoring, and equitable resource allocation. Targeted support for non-health professionals who serve as implementers, particularly in urban poor districts, could also strengthen program delivery and expand reach. Finally, incorporating student perspectives alongside outcome-based indicators in future evaluations would deepen understanding of effectiveness and long-term health impact. Taken together, these insights advance the understanding of how WinS is delivered in urban Philippine schools and provide practical entry points for strengthening WASH integration in comparable Southeast Asian settings.

5. Conclusions

Our study showed that the WinS program in the National Capital Region is generally rated as 'implemented,' with Sanitation being the only key element rated as 'fully implemented.' Deworming emerged as the most challenging element, while Funding Stability was the most complex domain. Implementation scores varied significantly based on implementer demographics such as age, position, subject taught, and grade level assignment. However, perceptions of program difficulty did not significantly differ based on these profiles.

Given these findings, a policy review of the deworming component is recommended to address persistent implementation challenges. Benchmarking against successful school-based health programs in comparable contexts may provide actionable strategies. In parallel, research into sustainable funding models is necessary to strengthen financial support for WinS implementation. Finally, qualitative studies exploring the lived experiences of program implementers are encouraged to deepen understanding of barriers and opportunities within school health programs and to inform future policy and programmatic refinements.

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Authors' Contributions

The author made substantial contributions to the conception and design of the study, the acquisition of data, and the analysis and interpretation of findings. He drafted the manuscript and reviewed it critically for important intellectual content.

The author approved the final version to be published and agrees to be accountable for all aspects of the work, ensuring that any questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

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Ethical Approval

The Ethics Review Board (OLFU-IERC) of

Lady of Fatima University, Valenzuela City, Philippines approved the present study with the Reference Number of 2022-IERC1-20538 v2. Also, written informed consent was obtained from the participants.

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