



Effect of Water, Sanitation and Hygiene (WASH) Interventions on Students' Educational Achievements in Secondary Schools in Kibra, Nairobi County

Author: Margery Wanjira Muriuki, Margaret Gikuihi and Susan Macharia

Department of Postgraduate in Education, The Catholic University of Eastern Africa
 P. O Box 62157-00200, Nairobi –Kenya
 Email: mmuthire@yahoo.com

ABSTRACT

The effects of school-based water, sanitation, and hygiene (WASH) interventions have had inconsistent results in terms of students' health and educational outcomes. This could be due to a lack of program fidelity or proper adherence to the implementation process. As such, this study examined the effects of provision of water, sanitation and hygiene (WASH) interventions on students' educational achievements in secondary schools in Kibra Sub-County, Nairobi County. The study used cross-sectional survey research design. A sample size of 344 students was selected through a combination of random cluster sampling and proportionate random sampling procedures. Questionnaires were used to collect data. Descriptive statistics which included frequency counts and percentages were used to analyze quantitative data from students' questionnaires and presented using tables. Statistical Package for Social Sciences (SPSS) version 23.0 was used to process the quantitative data. The data were then summarized and presented using tables. The study found that WASH interventions had an effect on education achievement in secondary schools in Kibra Sub-County. The study recommended that concerted effort was required to ensure that WASH interventions in secondary schools are observed at all times for better educational achievement. Furthermore, there is need for promotion of establishment of WASH clubs in all secondary schools in order to gain knowledge on WASH, sustain hygiene knowledge, share experiences, and increase students participation WASH activities.

Keywords: *Water and sanitation effects, sanitation interventions, student's hygiene interventions, educational achievements, WASH interventions*

1. INTRODUCTION

School-aged children in low-income settings are at substantial risk of water, sanitation, and hygiene (WASH) related infections such as pathogens causing diarrheal diseases, soil-transmitted helminths (STH), and trachoma. According to Chard, Garn, Chang, Clasen and Freeman (2019) crowded, unsanitary conditions may facilitate the spread of pathogens and increase students' risk for diseases. Conversely, access to adequate WASH facilities at school may have the potential to reduce the risk of diseases and absenteeism among school-aged



children (Trinies, Garn, Chang & Freeman, 2016). According to United Nations International Children's Emergency Fund [UNICEF], (2016) schools with adequate water, sanitation, and hygiene (WASH) facilities have reliable, sufficient and clean water supply; sufficient number of private toilets that are safe, clean, and gender segregated; adequate hand washing facilities with water and soap; and hygiene education in the school curriculum. These WASH facilities should cater for the whole school community which includes; small children, pubescent girls, and children with disabilities. Improved school WASH conditions for example, adequate water quality and quantity, provision of soap, improved latrine access and cleanliness may reduce students absence by providing a learning environment that that is clean, private and safe. Such school environments appeals to children, specifically older girls of menstruating age to attend school since they are guaranteed of personal hygiene at all time (Pearson & Mcphedran 2008).

A few studies have been documented on educational and health achievements associated with provision of WASH intervention in schools. For instance, a study conducted by Vally et al., (2019) on the impact of school-based water, sanitation and hygiene intervention on knowledge, practices, and diarrhoea rates in Philippines found that presence WASH program in schools appeared to increase knowledge and hygiene behaviors of students, reduce absenteeism, and increase hand washing among household members. On the other hand, a study conducted in Pakistan by Ahmed, Wong, Chua, Hydrie and Channa (2021) on the impact of WASH-related interventions and policy on children school performance found that the school performance was significantly associated ($P < 0.001$) with the presence of WASH interventions and/or WASH policy.

In Africa, a study by Garn, Trinies, Toubkiss and Freeman, (2017) on the role of adherence on the impact of a school-based water, sanitation, and hygiene intervention in Mali, found that increased access and adherence to multiple WASH components was important for improving health but that there was no effect of the intervention on pupil absence. The study findings suggested that a comprehensive WASH intervention and a focus on increasing adherence may help maximize the health effects of school WASH programs, but that WASH alone might not be sufficient to decrease pupils' absenteeism.

Additionally, a study conducted by Wanjiku, Gachahi and Mwaruvie, (2017) on availability of sanitation facilities in schools concluded that lack of sanitation amenities such as piped water and good toilets led to occurrence of diseases such as typhoid, cholera and other highly contagious diseases which affect learners' access to education through high absenteeism rates. The study further poised that sicknesses contributed to lower academic achievement among children due to absenteeism and low cognitive development due to illnesses. Lacks of proper Sanitation amenities was also associated with incidences of diseases among students and this resulted to increased rate of absenteeism in schools. Similarly, a study conducted by O'reilly et al., (2008) on the impact of a school-based safe water and hygiene programme on knowledge and practices of students and their parents in Nyanza province, western Kenya concluded that school-based safe water and hygiene programme described in the study showed promise for reducing



absenteeism by improving the quality of the school environment, and changing behaviour in the home through knowledge transfer from students to parents. This study therefore intended to examine the effect of water, sanitation and hygiene (WASH) interventions on students' educational achievements in secondary schools in Kibra, Nairobi County.

2. METHODOLOGY

The study employed cross-sectional research design. The selection of this research design was informed with the fact that the study targeted a number of schools in Kibra sub-county and therefore the design would be friendly in terms of time friendly, and that vast information is collected in a short period of time (Creswell & Clark, 2011).

The study targeted all the 18 secondary schools in Kibra Sub-County .8 were public while 10 were private. A total of 3277 form 3 and 4 students also formed the target population. From this target population, samples for data collection were selected.

Cluster and simple random sampling procedures were used to select 4 public and 6 private secondary schools. The schools were categorized as either public/private day or public/private boarding secondary school. The selection made a total of 10 secondary schools. This formed 55% of the total 18 secondary schools that is higher than the minimum 10% as recommended by (Creswell, 2014).

Homogeneous purposive sampling was used to pick form three and four students. These students were expected to bring on board several characteristics that enabled the researcher to make generalizable conclusions since they were believed to have stayed in the schools longer and comprehended the WASH resources available in the schools. Proportionate and Simple random sampling was used to identify 344 respondents for the study.

Table 1 shows a summary of the sample size of the respondents.

Table 1

Summary of sample size of the respondents

Respondents	Target Population	Sample Size
Students	3277	344

The sample size of students was 344 from a target population of 3277.

Questionnaires were utilized to collect information from students. The students' questionnaire generally covered background information and effects of water, sanitation, and hygiene (WASH) interventions on educational achievement.

The quantitative data obtained from the questionnaires were analyzed using descriptive statistics which included percentages and frequency counts. SPSS statistical software version 23.0 was used to aid the analysis quantitative data.



3. RESULTS

3.1 Demographic Characteristics

Slight below a half (47%) of the respondents were male while above half (53%) were female. In terms of age, a vast majority (82.3%) of the respondents were aged 17 years and above while 17.7% were aged between 15 and 16 years. Regarding the school category, 57.1% of respondents were from public schools while 42.9% were from the private schools.

3.2 Effect of WASH Interventions on Students' Educational Achievements in Secondary Schools

The purpose of this study was to determine the effect of WASH interventions on students' educational achievement in secondary schools in Kibra sub-county, Nairobi County. In order to address this objective, the study looked at the level of WASH implementation in secondary schools and WASH intervention effects on educational achievement.

3.2.1 Implementation of WASH Interventions in the Schools

The study examined the implementation of Water, Sanitation and Hygiene interventions in secondary schools.

Implementation of provision of Safe Drinking Water in Schools

Table 2

Implementation of provision of Safe Drinking Water in Schools

Characteristic	Category	Frequency	Percent
Amount of drinking water	Adequate	195	76.8%
	Not adequate	59	23.2%
Source of drinking water	Borehole	98	38.6%
	Well	14	5.7%
	Rainwater	29	11.4%
	Other	113	44.3%

Table 2 indicates that majority (76.8%) of respondents had adequate drinking water while 23.2% of respondents reported that drinking water was not adequate in their school. In addition, 38.6% of respondents said boreholes were the main source of drinking water, 11.4% responded by saying rainwater was the main source of drinking water. Another 5.7% said that wells were the main source of drinking water, and the remaining 44.3% reported other sources (not specified) of drinking water. The study suggested that safe drinking water was available in the majority of the schools sampled. According to the findings, boreholes, wells, and rainwater collection were some of the main sources of drinking water. From these research findings, the



researcher concluded that accessibility of safe drinking water implemented in majority of secondary schools in Kibra Sub-County.

Implementation of provision of Sanitation facilities in Schools

Table 3

Implementation of provision of Sanitation facilities in Schools

Characteristic	Category	Public (n=145)		Private(n=109)	
		Freq.	Percent	Freq.	Percent
Gender separate latrines	Yes	145	100%	109	100%
	No	0	0.0%	0	0.0%

According to Table 3, there was provision of latrines, specifically, gender-specific latrines, in all sampled public and private schools. This finding implied sanitation facilities were provided in all of the sampled secondary schools hence the intervention of provision of sanitation facilities was implemented in secondary schools in Kibra Sub-County.

Implementation of provision of Hygiene facilities in Schools

Table 4

Implementation of provision of Hygiene facilities in Schools

Characteristic	Category	Frequency	Percent
Availability of hand washing facilities	Yes	224	88.1%
	No	30	11.9%

As shown in Table 4, a vast majority (88.1%) of respondents agreed that hand washing facilities were provided in majority of the schools. On the other hand, a small percentage (11.1%) of respondents indicated that there was no provision of hand washing facilities. According to the study findings, hand washing facilities were provided in the majority of the sampled schools. This observation suggested that student's hygiene intervention had been implemented in the majority of the schools examined.



3.2.2 Effect of WASH Interventions on Students' Educational Achievements

The study sought to investigate the effect of wash interventions on students' educational achievements. Table 5 represents the distribution of the respondents by effect of provision of wash facilities on students' educational achievements.

Table 5

Effect of Provision of Wash facilities on Students' Educational Achievements

	Agree	Undecided	Disagree
Provision of water in my school has led to reduced cases of health problems which occur as a result of inadequate water.	178 (70.2%)	22 (8.8%)	54 (21.0%)
Providing free and safe drinking water in my school has reduced absenteeism among students.	111 (43.6%)	43 (16.9%)	100 (39.5%)
Provision of safe drinking water in my school has resulted in improved performance of students.	11 (43.8%)	39 (15.3%)	103 (40.9%)
Provision of proper sanitation facilities in my school has led to reduced cases of health problems.	191 (75.4%)	17 (6.6%)	46 (18.0%)
Provision of sanitation facilities in my school has reduced students' absenteeism.	145 (57.1%)	44 (17.3%)	65 (25.6%)
Good sanitation in my school affects students' education achieving positively.	117 (46.1%)	34 (13.2%)	103 (40.7%)
Student enrolment in my school has increased due to provision of adequate hygiene facilities.	121 (47.6%)	42 (16.7%)	91 (35.7%)
Access to adequate hygiene facilities in my school enhances student attendance.	165 (64.9%)	36 (14%)	54 (21.1%)
In my school, student absenteeism has decreased as a result of school-based hygiene programs.	111 (43.8%)	40 (15.8%)	103 (40.4%)
Availability and access to adequate hygiene facilities in my school is believed to yield improved academic performance among students.	142 (56.1%)	37 (14.6%)	75 (29.3%)
School-based hygiene programs in my school have reduced cases of hygiene related illness among students.	161 (63.5%)	32 (12.4%)	61 (24.1%)

As shown in Table 5, regarding the statement "Provision of water in my school has led to reduced cases of health problems which occur as a result of inadequate water," the majority (70.2%) of the respondents agreed to the statement, while 21% of the respondents disagreed and a small percentage (8.8%) of the respondent were undecided. The finding demonstrates that providing water in schools reduces health problems caused by insufficient water.

On the statement "Providing free and safe drinking water in my school has reduced absenteeism among students," 43.6% of the respondents were in agreement that free and safe water in school reduces absenteeism, while 39.5% of the respondents disagreed and the rest 16.9% were not



certain. These findings implied that providing free and safe drinking water in schools is likely to reduce student absenteeism.

With reference to the statement “Provision of safe drinking water in my school had resulted to improved performance of students,” 43.8% of the respondents agreed to this statement, 40.9% of the respondents disagreed while the rest 15.3% of the respondents were unsure about the statement. According to this finding, providing safe drinking water in schools had an impact on student performance.

In response to the statement “Provision of proper sanitation facilities in my school had led to reduced cases of health problems,” majority (75.4%) of the respondents were in agreement that provision of proper sanitation facilities in schools reduces cases of health problems, a small percentage (18%) disagreed with the statement while 6.6% were undecided. According to the findings, providing proper sanitation facilities in schools reduces health problems.

Referring to the statement “Provision of sanitation facilities in my school has reduced students’ absenteeism,” 57.1% of the respondents agreed that provision of sanitation facilities reduced absenteeism among students, 25.6% were disagreement with the statement and the rest 17.3% were uncertain. The outcome demonstrated that providing sanitation facilities in schools had the potential to reduce school absenteeism.

Concerning the statement “Good sanitation in my school affects students’ education achievement positively,” 46.1% of respondents agreed that good sanitation had a positive impact on educational achievement, while 40.7% of the respondents disagreed and 13.2% of the respondents were undecided. These findings suggested that providing good sanitation in schools improves educational achievement.

Following the statement “Student enrolment in my school has increased due to provision of adequate hygiene facilities,” nearly half (47.6%) of the respondents agreed that providing adequate hygiene facilities increases students enrollment in schools. Slightly above a third (35.7%) of the respondents disagreed that provision of adequate hygiene facilities increases students enrollment in schools while a small percentage (16.7%) were undecided if provision of adequate hygiene facilities increases students enrollment in schools. According to the findings, schools that provide adequate hygiene facilities attract a large number of students to enroll.

Pertaining to the statement “Access to adequate hygiene facilities in my school enhances student attendance,” nearly two thirds (64.9%) of the respondents agreed access to the statement while 21.1% of the respondents disagreed. The rest 14% were undecided. The results indicate that having hygiene facilities in schools improves student attendance.

In regards to the statement “In my school, student absenteeism has decreased as a result of school-based hygiene programs,” 43.8% of the respondents agreed to the statement, 40.4% of the respondents disagreed, and 15.8 percent were undecided. These findings implied that hygiene programs can reduce student absenteeism in the majority of schools.



With reference to the statement “Availability and access to adequate hygiene facilities in my school yield improved academic performance among students,” 56.1% of respondents agreed to the statement, while 39.3% disagreed and the remaining 14.6% were undecided. According to these findings, availability and access to hygiene facilities in schools enhances academic performance among students.

Regarding the statement “School-based hygiene programs in my school have reduced cases of hygiene related illness among students,” nearly two thirds (63.5%) of the respondents were in agreement that school-based hygiene programs reduces cases of hygiene rated illnesses among students while 24.1% of the students disagreed and 12.4% were undecided. As a result of this study, it can be concluded that school-based hygiene programs can reduce cases of hygiene-related illnesses among the students.

4. DISCUSSION

This study looked into how WASH interventions were implemented in secondary schools in Kibra Sub-County. The researcher discovered that majority of the sampled schools had implemented interventions of provision of safe drinking water, sanitation and hygiene facilities. The study found that implementation of these interventions was associated with reduced absenteeism among students. These findings were consistent with those of Bowen et al. (2007), who discovered that implementing a large-scale hand washing promotion program and provision of soap was associated with significantly lower absenteeism among students.

The study also looked at the effects of WASH interventions on reducing health issues among students. According to the findings, WASH interventions reduced health issues among students. These findings were in line with a study conducted by McMichael (2019) which found that school-based WASH interventions could protect against diarrhoea and other WASH-related illnesses like soil-transmitted helminthes and acute respiratory infections. In addition, WASH interventions were reported to increase WASH-related knowledge and practices and improved educational outcomes such as reduced absences.

The study went on to investigate how WASH interventions affected student absenteeism in schools. The study found that provision of WASH interventions in schools reduced students absenteeism. Related to the findings of this study were the observations made by Trinies et al., (2016). The study reported that implementation of WASH program in schools had a positive effect on absenteeism.

Additionally, this study investigated how implementing WASH interventions affected student enrollment and attendance. According to the study findings, implementing WASH interventions increases student enrollment and attendance. These findings were similar to those of Komarulzaman, de Jong, and Smits (2019), who discovered that availability of WASH programs positively related to school enrollment and attendance.



In overall, the study looked at the effects of implementing WASH interventions on educational achievement. WASH interventions were found to improve students educational achievements. Since the study findings by Mills & Cumming (2016) reported that absence of WASH facilities in schools act as a barrier to students' attendance and enrolment, affecting overall educational achievements, the converse is therefore true as demonstrated in this current study.

5. CONCLUSION

The study findings suggest that WASH interventions in schools are associated with students' educational achievements. However, despite the positive effects of WASH interventions on educational outcomes, there are gaps in terms of implementation. Poor implementation of WASH interventions in schools has profound impact on students' educational achievements. The study recommends that a concerted effort is required to ensure that WASH implementation in secondary school is observed at all times for improved students' educational achievements. Furthermore, there is need for promotion of the establishment of WASH clubs in all secondary schools in order to sustain hygiene knowledge, share experiences, gain new WASH knowledge, and increase student participation on the same.

REFERENCES

- Ahmed, J., Wong, L. P., Chua, Y. P., Hydrie, M. Z. I., & Channa, N. (2021). Drinking water, sanitation, and hygiene (WASH) situation in primary schools of Pakistan: the impact of WASH-related interventions and policy on children school performance. *Environmental Science and Pollution Research*, 1-19.
- Bowen, A., Ma, H., Ou, J., Billhimer, W., Long, T., Mintz, E., ... & Luby, S. (2007). A cluster-randomized controlled trial evaluating the effect of a handwashing-promotion program in Chinese primary schools. *The American journal of tropical medicine and hygiene*, 76(6), 1166-1173.
- Chard, A. N., Garn, J. V., Chang, H. H., Clasen, T., & Freeman, M. C. (2019). Impact of a school-based water, sanitation, and hygiene intervention on school absence, diarrhea, respiratory infection, and soil-transmitted helminths: results from the WASH HELPS cluster-randomized trial. *Journal of global health*, 9(2).
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research*. Sage publications.
- Creswell, R. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods research*(2nd ed.).thousands Oaks, CA: Sage Publications, Inc.



- Garn, J. V., Trinies, V., Toubkiss, J., & Freeman, M. C. (2017). The role of adherence on the impact of a school-based water, sanitation, and hygiene intervention in Mali. *The American journal of tropical medicine and hygiene*, 96(4), 984.
- Komarulzaman, A., de Jong, E., & Smits, J. (2019). Effects of water and health on primary school enrolment and absenteeism in Indonesia. *Journal of water and health*, 17(4), 633-646.
- McMichael, C. (2019). Water, sanitation and hygiene (WASH) in schools in low-income countries: A review of evidence of impact. *International journal of environmental research and public health*, 16(3), 359.
- Mills, J. E., & Cumming, O. (2016). The impact of water, sanitation and hygiene on key health and social outcomes. *Sanitation and Hygiene Applied Research for Equity (SHARE) and UNICEF*, 112.
- O'reilly, C. E., Freeman, M. C., Ravani, M., Migele, J., Mwaki, A., Ayalo, M., ... & Quick, R. (2008). The impact of a school-based safe water and hygiene programme on knowledge and practices of students and their parents: Nyanza Province, western Kenya, 2006. *Epidemiology & Infection*, 136(1), 80-91.
- Pearson, J., & McPhedran, K. (2008). A literature review of the non-health impacts of sanitation. *Waterlines*, 48-61.
- Trinies, V., Garn, J. V., Chang, H. H., & Freeman, M. C. (2016). The Impact of a school-based water, sanitation, and hygiene program on absenteeism, diarrhea, and respiratory infection: a matched-control trial in Mali. *The American journal of tropical medicine and hygiene*, 94(6), 1418.
- Trinies, V., Garn, J. V., Chang, H. H., & Freeman, M. C. (2016). The Impact of a school-based water, sanitation, and hygiene program on absenteeism, diarrhea, and respiratory infection: a matched-control trial in Mali. *The American journal of tropical medicine and hygiene*, 94(6), 1418.
- UNICEF. (2016). WHO. Core Questions and Indicators for Monitoring WASH in Schools in the Sustainable Development Goals. *World Health Organization: Geneva, Switzerland*.
- Vally, H., McMichael, C., Doherty, C., Li, X., Guevarra, G., & Tobias, P. (2019). The impact of a school-based water, sanitation and hygiene intervention on knowledge, practices, and diarrhoea rates in the Philippines. *International journal of environmental research and public health*, 16(21), 4056.



Journal of Education in Developing Economies, vol 2 (2), 2021 (online)
Website: www.writersbureau.net

- Wanga, O. (2013). Influence Of School Water, Sanitation & Hygiene Programs On Pupils' Performance Among Rural Public Primary Schools In Maseno Division, Kisumu County, Kenya. *Erepository.uonbi.ac.ke*. Retrieved from <http://erepository.uonbi.ac.ke/handle/11295/57894>.
- Wanjiku, G. P., Gachahi, M. W., & Mwaruvie, J. (2017). Influence Of Social Amenities On Academic Performance In Primary Schools In Gichugu Constituency, Kenya.