Vol. 13(4), pp. 254-261, October-December 2021
DOI: 10.5897/JPHE2020.1298
Article Number: 9EC032268143
ISSN 2141-2316

http://www.academicjournals.org/JPHE

ACADEMIC JOURNALS

Journal of Public Health and Epidemiology

Full Length Research Paper

Water, sanitation, and hygiene practices in secondary schools in the Buea Health District of Cameroon

Ekun William Ashu[1], Verla Vincent Siysi[2] and Nsagha Dickson Shey[1*]

[1]Department of Public Health and Hygiene, Faculty of Health Sciences, University of Buea, P.O. Box 63-Buea, Cameroon.
[2]Department of Internal Medicine and Pediatrics, Faculty of health Sciences, University of Buea, P.O. Box 63-Buea, Cameroon.

Receive 25 November, 2020: Accepted 17 June, 2021

This study assessed water, sanitation and hygiene practices in public and private secondary schools in Buea. A cross-sectional descriptive study was conducted from November 2017 to June 2018 in Buea. Students from Baptist High School Buea, Government Bilingual High School Muea, Buea, Government Technical High School Molyko, Buea and Summerset Secondary School Buea were assessed on water, sanitation and hygiene practices. Data were collected using questionnaire and direct observations. A total of 384 students were sampled, and probability proportionate to size was used to determine the sample size per school. The statistical software SPSS V20 and Microsoft Excel were used to analyze the data. Statistical significance was set at $p < 0.05$. Majority, 290 (75.5%), of the students were from public secondary schools; most, 314 (81.1%), of the students were from schools with secured space (fence). Using public tap as the main source of water was significantly associated with the type of school (X^2=62.239, P=0.000). A greater proportion 285 (98.2%)[95%CI:96-99] of public secondary schools and 68 (72.2%)[95%CI:62-81] of private secondary schools do not have basic WASH facilities (wash stand, wash hand bolls, soap) closer to the toilet for use by the students. A greater percentage, 126 (43.6%)[95%CI:38-49], of students from public secondary schools and a majority, 59 (62.6%)[95%CI:52-73], from private secondary schools said water scarcity is the reason why they do not wash their hands after using the toilet. The results of this study show that there is inadequate water supply, poor sanitation and hygiene practices within the study area. Schools associations should collaborate and make available facilities like soap and toilet tissues and even construction of modern toilets in schools to foster the practice of hygiene activities.

Key words: Water, sanitation, hygiene, students, private and public secondary schools.

INTRODUCTION

WASH stands for water, sanitation and hygiene. Water is a liquid that descends from the clouds as rain, forms streams, lakes, seas, and is a major constituent of all living matter; when pure is odorless, tasteless and colorless (UNICEF, 2018). Sanitation is interventions that reduce human exposure to diseases by providing a clean environment in which to live. It involves both behaviors and facilities, which work together to form a hygienic environment (UNICEF, 2018). Hygiene is the practice of keeping oneself and the surroundings clean, especially in order to prevent illness or the spread of disease (Collins, 2018). Clean water, basic toilets and good hygiene

practices are essential for the survival and development of children. Today, there are around 2.4 billion people who do not use improved sanitation, and 663 million who do not have access to improved water sources (Catarina, 2018; UNICEF, 2018). Diseases related to inadequate water, sanitation and hygiene are a huge burden in developing countries. It is estimated that 88% of diarrheal disease is caused by unsafe water supply, and inadequate sanitation and hygiene (WHO, 2018; UNICEF/IWSC, 2007). Many schools serve communities that have a high prevalence of diseases related to inadequate water supply, sanitation and hygiene, and where child malnutrition and other underlying health problems are common. Schools, particularly those in rural areas, often completely lack drinking water and sanitation and hand washing facilities; alternatively, where such facilities do exist they are often inadequate in both quality and quantity (UNICEF, 2007 O'reilly et al, 2008; Deroo, et al, 2015). Schools with poor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's particular susceptibility to environmental health hazards (Alibhai and Ahmad, 2001). Children's ability to learn may be affected by inadequate water, sanitation and hygiene conditions in several ways; leading to helminth infections (which affect hundreds of millions of school-age children), long term exposure to chemical contaminants in water (lead and arsenic), diarrheal diseases and malaria infections, all of which forces many school children to be absent from school (WHO, 2004; Alibhai and Ahmad, 2001). Data are warranted to guide the development of policies by the stakeholders in order to improve on water, sanitation and hygiene practices in schools. Good policies can better the school environment and improve on the living conditions of the students and of the community at large. The main aim of this study was to determine the WASH practices in public and private secondary schools in the Buea Health District of Cameroon.

MATERIALS AND METHODS

This study was carried out in Buea, the Regional capital of the South West Region of Cameroon. Buea has a total of 31 secondary schools which are either public or privately owned. Ten public general education secondary schools, three public technical education secondary schools, eight boarding secondary schools and ten day private secondary schools were used (Figure 1).

This study was a descriptive cross-sectional community based study and was carried out from November 2017 to June 2018.

Secondary school students in the Buea Health District make up the study population; the sample size for this study was 384 students. The sample size was determined using the Cochrans formula for sample size determination (Eng, 2003):

$$n = \frac{(Z)^2 p(1-p)}{e^2}$$

Where n= sample size; Z= = 1.96 (standard normal value at 95% confidence level); p= estimated proportion of an attribute that is present in the population = 50%. e= precision of the event of interest = 0.05

$$n = \frac{(1.96)^2(0.5)(1-0.5)}{0.05^2} = 384 \text{ participants}$$

Probability proportionate to size sampling was used to determine the number of students to sample in each of the four secondary schools in the Buea Health District (Table 1).

An ethical clearance (2018/0198/UB/SG/IRB/FSH) was issued by the IRB of the Faculty of Health Sciences of the University of Buea. Administrative approval was sought from the department of Public Health and Hygiene, Faculty of Health Science, University of Buea. Later, approval was sought from the Regional Delegation of Public Health for the South West Region, Heads of the various schools. Direct observation and a well-structured questionnaire were the tools for data collection and a consent form was signed by participants who accepted to take part in the study.

Statistical software's SPSS V20 and Microsoft Excel 2013 were used to analyze the data. The analyzed data was presented in tables and bar charts. Bivariate analysis was computed using chi-square test to assess the relationship or association between variables. During analysis, P-values of less than or equal to 0.05 was considered statistically significant, while P-values of more than 0.05 was considered not to be statistically significant.

RESULTS

Demographic characteristics of selected secondary schools in the Buea Health District

This study involved four secondary schools, two public and two private. The majority of participants (290, 75.5%) were students from public secondary schools and most of them (356, 92.7%) attended day session, while some (28, 7.3%) were boarding school students. A greater number (314, 81.1%) were participants from schools with fence, which offers a secured space for students. Among the schools, the oldest school building was 42 years and the most populated school had 1600 students. The average student per class ratio was 76-100 students per class. From observation, most of the schools were dirty, majority of the students who drank water from the tap were using their hands and a greater proportion did not

*Corresponding author. E-mail: nsaghads@hotmail.com. Tel: +237677499429.

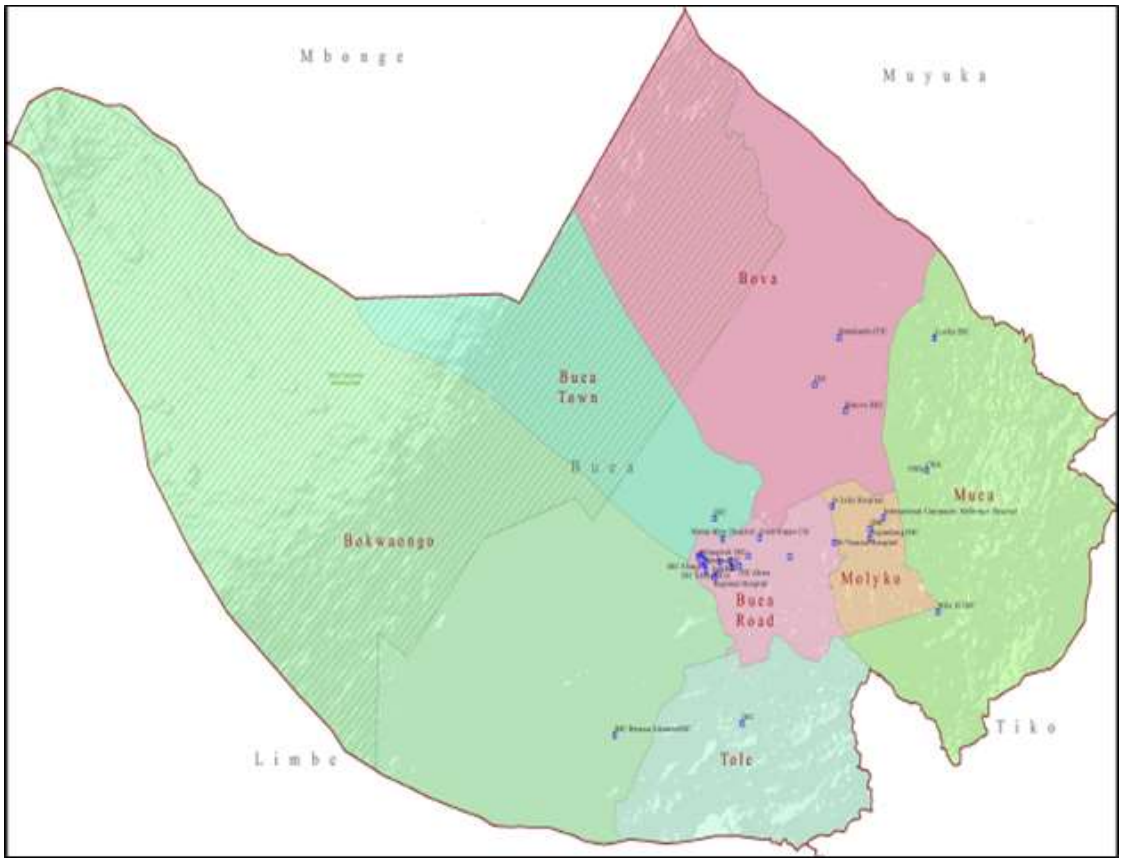

Figure 1. The map of Buea Health District showing the study areas (MINSANTE, 2020). ▲indicates the study community.

wash their hands before drinking while just a few washed their hands before drinking directly from the tap.

Water sources in secondary schools

Among the two types of schools, their main water sources were public tap (Camwater). Most 197 (51.3%) [95% CI: 46-56] of the students reported that their tap were functional at the time of study; and 187 (48.7%) [95% CI: 43-53] reported nonfunctional taps. Public secondary schools had a higher respond rate,182 (62.8%) [95% CI: 56-68], of functional taps. Using Public tap as the main source of water was significantly associated with the type of school (X^2=62.239, P=0.000) (Table 2).

Majority, 133 (34.6%) [95% CI: 29-39], of the participants reported having alternative sources of water (Borehole, community water) and 251 (65.4%) [95% CI: 60-70] reported not having alternative water sources in school. Private secondary schools had a higher respond rate; 72(76.6%) [95% CI: 67-85] reported to have alternative water sources (Borehole, community water). Using alternative water sources (Borehole, community tap water) was significantly associated with the type of school (X^2=96.800, P=0.000) (Table 2).

Closeness of WASH facilities to the toilet in secondary schools

The results show that (285, 98.2%) [95% CI: 96-99] of public secondary schools and (68, 72.2%) [95% CI: 62-81] of private secondary schools do not have basic WASH facilities (wash stand, wash hand bolls, soap) closer to the toilet for use by the students as shown in Figure 2.

Different methods of waste disposal in secondary schools

Half (146, 50.3%) [95% CI: 44-56] of the respondent from public secondary schools reported of burning dirt and (59,

Table 1. Probability proportionate to size sampling for the four secondary schools in the Buea Health District, Cameroon.

Schools	Total population of the four schools	Proportion	Sample size per school
GTHS Molyko Buea	1600	0.39	150
GBHS Muea	1500	0.37	140
Summerset Buea	300	0.07	28
BHS Buea	700	0.17	66
Total	4100	1.00	384

Table 2. Water Sources in Secondary Schools in the Buea Health District, Cameroon.

WASH Facility	Type of School		Statistic		
	Public School No (%)	Private school No (%)	Total	X^2	p-value
Main source of water					
Functional taps	182 (62.8)	15 (16.0)	197(51.3)	62.239	0.000
Non-functional taps	108 (37.2)	79 (84.0)	187(48.7)		
Alternative water sources (Borehole, community tap water)					
Present	61(21.0)	72(76.6)	133(34.6)	96.800	0.000
Absent	229(79.0)	22(23.4)	251(65.4)		

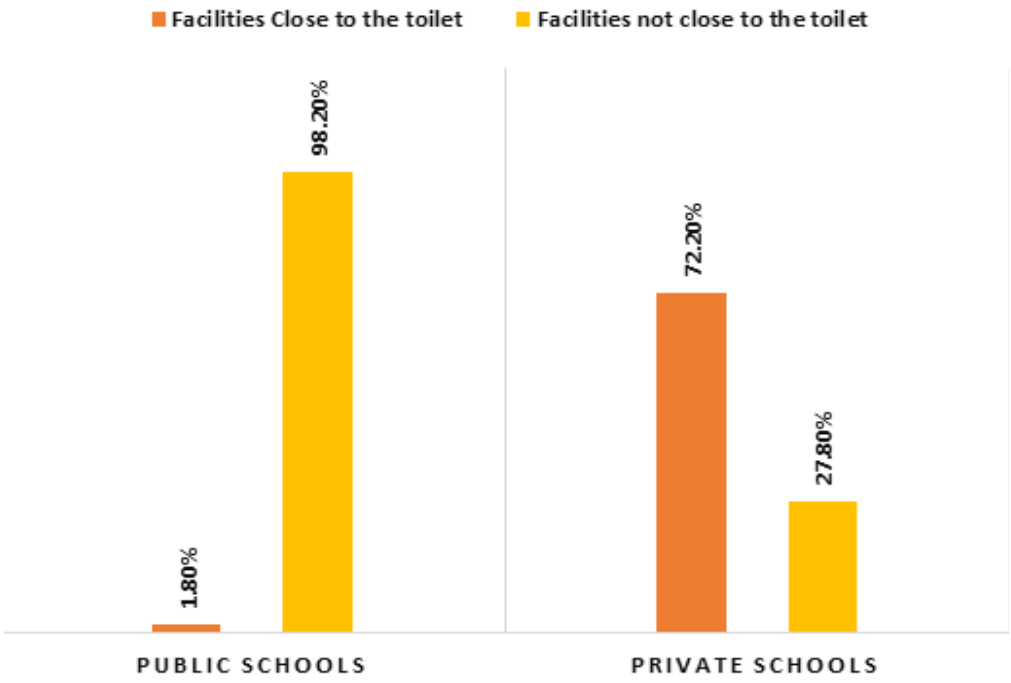

Figure 2. Closeness of WASH facilities to the toilet in secondary schools in the Buea Health District, Cameroon.

62.4%)[95% CI: 52-73] from private secondary schools reported of dumping dirt for HYSACAM (Hygiene et Salubrite du Cameroon) to carry away as presented in Figure 3.

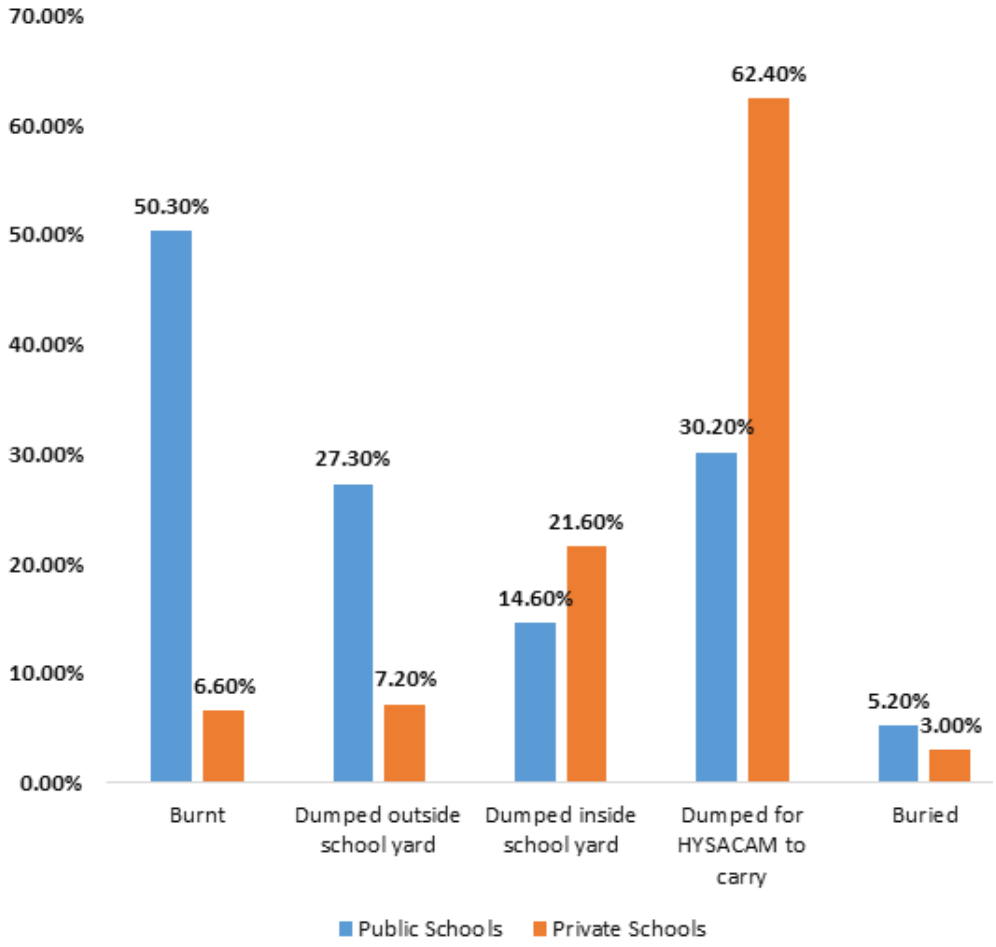

Figure 3. Methods of Waste disposal by schools in the Buea Health District, Cameroon.

Reasons why students do not wash their hands after using the toilet in schools

A greater percentage (126, 43.6%) [95% CI: 37-49] of students from public secondary schools and a majority (59, 62.6%) [95% CI: 52-73] from private secondary schools said water scarcity is the reason why they do not wash their hands after using the toilet and 2.9% from public secondary schools and 3.1% from private secondary schools said they always forget to wash their hands after using the toilet as presented in Figure 4.

Reasons why students do not wash their hands before eating during break

The result shows that (116, 40.2%)[95% CI: 34-46] of students from public secondary schools and (49, 52.2%) [95% CI: 41-63] of students from private secondary schools do not wash hands before eating during break because of water scarcity and a lesser percentage 5.9% of the students from public secondary schools and 4.6% from private secondary schools said crowded tap is the reason they do not wash their hands during break before eating as presented in Figure 5.

DISCUSSION

Importance of the study

The Sustainable Development Objective (SDG) 6, envisages by 2030, access to adequate water, sanitation and hygiene services for all. The inadequacy of these services in the school environment will hamper the achievement of this goal, so far many secondary schools in the developing countries do not have adequate WASH facilities and the consequences for educational performance are established (WHO, 2000; UN, 2014). This study was carried out to assess WASH practices in

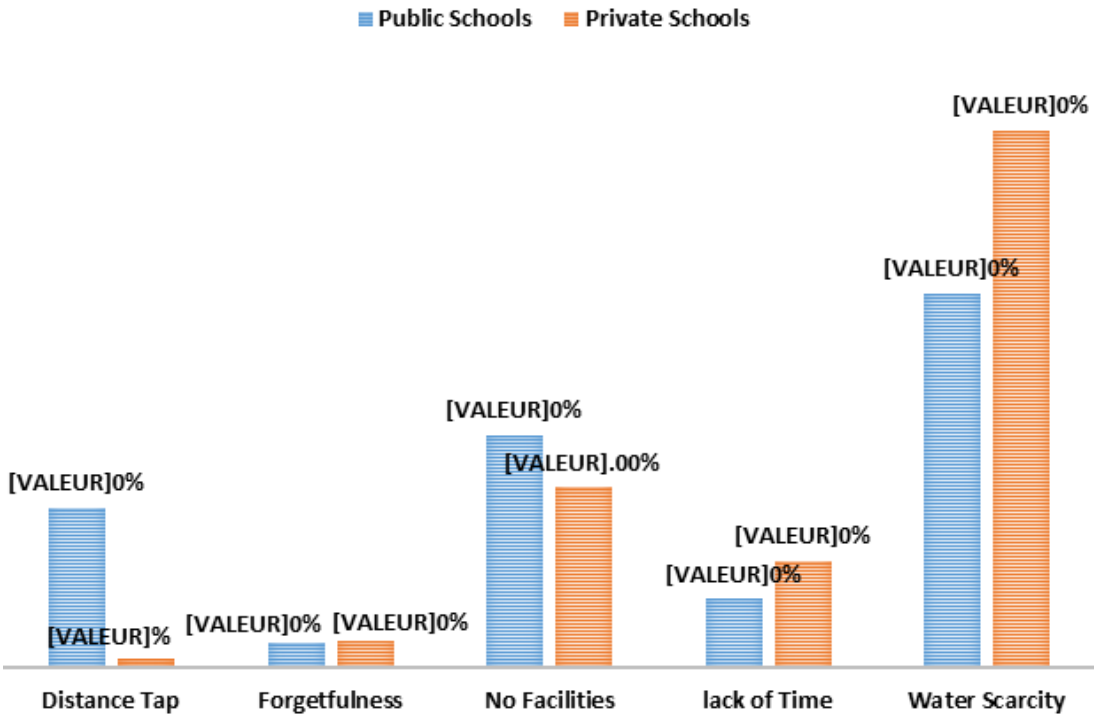

Figure 4. Reasons why students do not wash their hands after using the toilets in secondary schools in the Buea Health District, Cameroon.

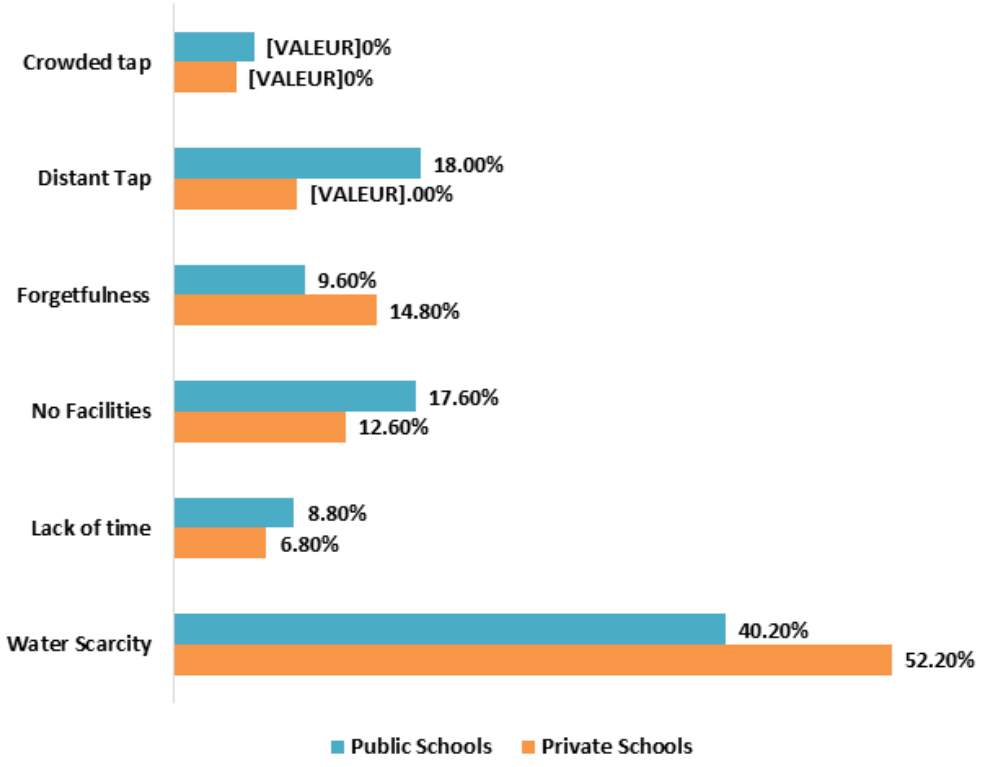

Figure 5. Reasons why students do not wash hands before eating during break in secondary schools in the Buea Health District, Cameroon.

public and private secondary schools in the Buea Health District. The WASH program in schools contributes to a safe school environment, healthier students in school and a better result. Adequate WASH facilities and activities in secondary schools will reduce the number of WASH related diseases (diarrhoea, typhoid, cholera, malaria, and hepatitis), absenteeism and school dropout which improve on the educational system and nation building at large. This study identified weaknesses related to WASH practices in secondary schools and proposed strategies to improve on WASH activities in secondary schools in the Buea Health District.

Availability of WASH facilities in secondary schools in the Buea Health District, Cameroon

Many of the students were from schools with secured space (Fence) which is in line with the WASH guideline in schools by WHO (2009) stating the need for secured space in schools which prevent intrusions by animals and other persons. The main source of water for drinking in schools is Camwater, the conventional distribution network. The available water complies with the drinking water standards required by the Cameroonian legislation for potable water. A good number of public secondary school does not have basic facilities (wash stand, wash hand boll and soap). From observations made, most toilets in secondary schools in the Buea Health District were found to be dirty, doors open and some toilets do not have door, no privacy for the students when using the toilets. This aspect is not in line with the WASH guideline for schools in low- cost setting by Adams et al. (2009), they stated that toilets should be kept clean and doors always closed to avoid transmission of diseases and toilets should have doors for users' privacy and protection. The student / toilet ratio was as high as (160/1) far above the recommended standard by WHO in 2009 (1 toilet for 30-50 students). Many public and private secondary schools in the Buea health district had just two water points supplying a population of 700 students and more which was far above the recommended standards (150-200 students/ water point) (WHO, 2009). Most secondary schools do not have cleaners and the absence of cleaners and cleaning equipment, contributed to the dirty school environment and dirty toilets, which consequently become areas where students can easily contact pathogenic germ and various infectious diseases. The girls/ boys separate aspect of toilets was respected, the security of the girls are not ensured in most schools due to unhealthy toilets students are practicing open urination and defecate to meet their needs, in line with a study conducted in Yaoundé by Annie-Claude and Dieudonne (2017) stating that unhealthy sanitary toilets will cause users to carry out malpractices like open urination. Most public schools and private schools do not have toiletries and hand washing facilities closer to the toilets as recommended by WASH standard for schools in low-cost settings (Adams et al (2009).

WASH practices in secondary schools in Buea

Water scarcity was the main reason for poor hand washing practices by students in secondary school as a greater part of students from public schools and private schools indicated that water scarcity is the reason they do not wash their hands before eating during break and after using the toilet. Lack of basic WASH facilities like wash hand stands and soap in schools contributed to poor hygienic practices among students. Dirty toilets were one of the reasons why most students practiced open urination. The result in line with a study conducted by Guinan et al. (2002) stating that most schools lack latrines and safe water for drinking and hygienic practices, which eventually leads to absenteeism and high dropout rates in schools. Lack of basic facilities will force student to carry out poor hygienic practices like open defecation and urination. A good number of public secondary schools disposed their waste by burning and a majority from private secondary schools dump for HYSACAM (Hygiene et salubrite du Cameroun) to carry away.

Conclusion

This study revealed that most secondary schools in the Buea Health District lack the necessary facilities needed for the implementation of water, sanitation and hygiene activities. A greater proportion of the students do not practice water, sanitation and hygiene activities in schools due to lack of basic materials like soap, toiletries and also water scarcity.

Recommendations

From the findings of this study, we therefore recommend that: the government should review policies about WASH in schools to enable establishment of adequate facilities in all public and private institutions before they go operational; multi sectorial collaboration is needed (ministries of education, health, public works and finance) and should support schools with the building of modern toilets, wash handstand with taps and other WASH related facilities; a department should be created in schools to ensure the implementation of WASH related activities, especially the cleanliness of school toilets; schools associations should collaborate and make available facilities like soap, toilet tissues and even

construction of modern toilets in schools; WASH education should be emphasize at all levels of the school program, more emphasis on practical classes; schools should employ cleaner who will be taking care of the school environment and the toilets; students should be encouraged to take active part in the implementation of WASH activities in schools; schools with water scarcity issue should construct or make available alternative water sources (Boreholes, reservoirs) for use in case of non-availability of the main source.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

ACKNOWLEDGEMENTS

The authors are grateful to Prof. Nsagha Dickson Shey and Prof. Verla Vincent for their support during the course of this research. They are also grateful to the lecturers of the department of public health and hygiene for their support.

REFERENCES

Adams J, Bartram J, Chartier Y, Sims J, World Health Organization. (2009). Water, sanitation and hygiene standards for schools in low-cost settings / edited by John Adams ... [et al]. World Health Organization. https://apps.who.int/iris/handle/10665/44159.

Alibhai K, Ahmad T (2001). Promotion of healthier behaviour through schools'. In: Scott, R. People and systems for water, sanitation and health. Proceedings of the 27th WEDC Conference, Lusaka, Zambia.

Annie-claude P, Dieudonne N (2017). WASH Implementation in Some Public secondary schools in Yaounde, Cameroon. International Journal of Innovative Research and Development 6:133-139.

Catarina de Albuquerque (2018). Realising the human rights to water and sanitation: a handbook by the UN Special Rapporteur Catarina de Albuquerque. Available at: .http://www.ohchr.org/EN/Issues/WaterAndSanitation/SRWater/Pages/Handbook.aspx [Accessed on 12 Feb 2018].

Collins (2018). English Dictionary. Explain definition and meaning. Available at: https://www.collinsdictionary.com/dictionary/english/ [Accessed on 24 Feb 2018].

Deroo L, Walter E, Graham J (2015). Monitoring and evaluation of WASH in schools programs: lessons from implementing organizations. Journal of Water Sanitation and Hygiene for Development 5(3):512-520.

Eng J (2003). Sample size estimation: how many individuals should be studied? Radiology 227(2):309-313.

Guinan M, Mcguckin M, Ali Y (2002). The effect of a comprehensive hand washing program on absenteeism in elementary schools. American Journal of Infection Control 30(4):217-220.

MINSANTE (2020). Cameroon Health Map 2020.

O'reilly CE, Freeman MC, 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 and Infection 136(1):80-91.

United Nations (UN) (2014). Special Rapporteur on the Human Right to Safe Drinking Water and Sanitation.

United Nations Children's Fund (UNICEF) (2018). Water, Sanitation and Hygiene. Available at: http://www.unicef.org/wash/index_water_quality.html [Accessed on 25 Feb 2018].

UNICEF/IRC (2007). Towards effective programming for WASH in schools. Delft, The Netherlands, IRC International Water and Sanitation Centre. Technical paper series 48:84-105.

United Nations Children's Fund / International Water and Sanitation Centre (UNICEF/IWSC) (2007). Towards effective programming for WASH in schools 3:22-28.

World Health Organization (WHO) (2000). Global Water Supply and Sanitation Assessment. Available at: http://www.unicef.org/wash/index_water_quality.html [Accessed on 28 January 2018].

World Health Organization (WHO) (2004). Guidelines for drinking-water quality, 3rd ed.Vol.1. Available at: http://www.who.int/water_sanitation_health/dwq [Accessed on 4 March 2018].

World Health Organization (WHO) (2018). The situation of water, sanitation and hygiene in schools in the pan-European region. Available at: (http://www.wssinfo.org/taskforces/ [Accessed on 28 Feb 2018].