

Nature of Environmental Sanitation Practices in Ghana: A Social Survey on Selected Basic Schools in Koforidua Municipality in the Eastern Region

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Abstract

Proper hygiene and sanitation should be inculcated in Basic School learners for healthy learning environment. This study adopted a mixed method approach. The study was carried out in seven selected basic schools in Koforidua municipality in the Eastern Region of Ghana. Purposive and simple random sampling techniques were used to select two hundred respondents for the study. Questionnaires, interviews and observations were used to gather the data. The study revealed that there were poor sanitary conditions and indiscriminate disposal of solid waste in the schools because bins were not adequate and poorly hygienic. The study also concluded that, the activities of food vendors and other traders in the schools were not clearly monitored frequently. The study also revealed that, all the selected schools did not have adequate proper toilets and urinal facilities and this created unhygienic surroundings inside and outside these facilities resulting in odour nuisance. The odour and houseflies produced from the toilets and the urinal do not auger well for the selected schools, none of the schools had proper hand washing facilities prescribed by the Ghana Education Service (GES). It is recommended that, sanitation, hygienic and health education should be carried out in schools to sensitize pupils understanding on the dangers of poor sanitation. It is further recommended that, proper hand washing facilities, such as veronica buckets, soap and tissues should be provided to promote proper hand washing in schools.

Keywords

Nature, Environment, Sanitation, Basic Schools, Koforidua, Ghana

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1. Introduction and Background

The present day problem of waste management has reached a greater proportion in developing countries [1]. Introduction of solid waste is an unavoidable by- product of human activities. However, solid waste may be regarded as any rejected material resulting from domestic activity and industrial operations for which there is no economic demand

and this must be disposed off [2]. Economic development, urbanization, and improved living standards of people increase the quantity and complexity of generated municipal solid waste (MSW). Disposal of human and other wastes did not pose a significant problem because the population was relatively small and the land available for assimilation of waste was relatively large [3]. Urban areas consume natural resources and generate waste which has to be disposed off inside and outside the city boundaries. Urban areas present

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environmental problems over a range of spatial scales: households, workplaces, the neighbourhood, the city, the wider region and the world. Managing solid waste is one of the costliest urban services to provide; typically, it absorbs up to 1% of GNP and 20 – 40% of municipal revenue of developing countries. Municipal solid waste management services are frequently inadequate, with more than half of the refuse generated in urban areas remaining uncollected, and large areas of cities receiving no regular attention [4].

However, economic development, urbanization, improved living standards in cities, and increase in enrolments of school children due to government policies in developing countries have increased the quantity and complexity of generated solid waste in schools. If accumulated, this class of municipal solid waste may lead to degradation of the urban environment, stresses limited natural resources and may lead to various health issues. Indeed, most schools are facing a high level of pollution [5]. The situation in developing countries is more acute, partly because of the lack of adequate solid waste disposal facilities [6]. The responsibility of providing solid waste management services often lies with local governments, and a fundamental deficiency is the failure of governments to assume their basic responsibility to raise sufficient funds to provide an acceptable level of services [3].

Even the limited funds available are frequently used to acquire inadequate and often inappropriate pieces of equipment or to maintain an insufficient, obsolete collection fleet. Consequently, the services provided in majority of cities and towns in developing countries can best be described as unreliable, irregular, and inefficient [4].

Inadequate or unavailable solid waste collection and disposal services results in indiscriminate dumping of waste on streets and public areas, clogging of urban drainage systems, contamination of water resources and proliferation of insect and rodent vectors [3]. The public may be affected by contamination of its drinking water, by soil contamination passed unto the aquatic and terrestrial food chain, and through the spread of diseases by vectors. Associated with the increasing population are rising levels of affluence, shorter product cycles and the larger number of packaging products, consumption and the demand for portable products that have brought increases in the solid waste stream [7]. There is no single solution to the challenge of waste management. The waste management processes is usually framed in terms of generation, storage, treatment, disposal and transportation. Hence, a combination of source reduction, recycling, incineration and landfills is currently the optimal way to manage solid waste [4]. It becomes important for this study to examine the nature of environmental practices in some selected basic schools in the Koforidua Municipality.

Management of waste is a critical problem today and Educational Institutions are also a major contributor to the city's waste stream. Significant amount of horticultural waste is generated in schools. School Canteens are also a major contributor of waste in schools. A good amount of plastic disposables are thrown with the leftover food; and apart from the biodegradable and paper, plastic wastes, e-wastes like tube lights, bulbs, paint containers, computer parts, broken bottles, broken glasses, etc are found in the waste stream from schools which makes source separation and resource recovery very difficult [8].

Diseases related to poor sanitation and hygiene is a huge burden in developing countries. It is estimated that 88% of diarrhoeal disease cases is caused by unsafe water supply, and inadequate sanitation and hygiene [9]. Some of the effects of indiscriminate disposal of waste is that, it attracts rats, insects and other pests, waste are also fire hazards and the interaction of waste with surface water can dissolve out or leached harmful chemicals. Surface runoff infests chemicals percolation into ground water and eventually contaminates the water resource. The waste can be scattered by wind or water and the gases arising from the dump may be toxic [9].

Schools that lack proper sanitation and efficient waste management will have an increased incidence of major childhood illness among their students. Poor health is an important underlying factor for low school enrolment, absenteeism, poor school performance, and early school dropout. Proper hygiene and sanitation can create an enabling learning environment that contributes to children's improved health, welfare and learning performances [5].

Koforidua has many educational institutions and inadequate information on the quantity, type and characteristics of wastes as well as poor operation and maintenance of sanitation facilities are leading to serious environmental and health issues in the schools. The sensitive issue of unsightly conditions in educational institutions can pollute the natural environment and could cause health hazards for the entire school community. Children are our future leaders and for that matter, there is the need to pay attention to their learning environment [8]. This study therefore seeks to assess the nature environmental sanitation in the selected basic schools in the Koforidua municipality. The study was guided by this research question- what is the nature of environmental sanitation practices in the selected basic schools in the Koforidua municipality

2. Review of the Literature

Waste is a direct result of human interaction and activities. Nevertheless, there seems to be several opinions as to what

constitute a waste. Several researchers however agreed that wastes are materials whose owners no longer have a need for. Therefore, it is obvious that waste is indeed subjective in meaning, as the term is open to several interpretations and also influenced by personal opinion. Nevertheless, it is important to provide a definition or at least a guide for the purposes of policies and legislations. This is evident from the fact that, it is the knowledge of what specifically constitute a waste and the categories of wastes that determines how wastes are dealt with or managed [10].

Around the world, waste generation rates are rising. In 2016, the world's cities generated tons of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tons in 2050. Compared to those in developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned. These practices create serious health, safety, and environmental consequences. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote urban violence [11].

A solid waste can be hazardous or non-hazardous. Hazardous solid waste is the one which because of its quantity, concentration or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or to an increase in serious irreversible or incapacitating illness. Hazardous waste poses a sustainable danger immediately or over a period of time to human, plant or animal life. A waste is classified as hazardous if it exhibits any of the following characteristics: ignitability, corrosiveness, reactivity, toxicity [2].

Solid waste defined as either waste water discharges or atmospheric emission, arising from domestic, commercial industrial and institutional activities in an urban area. Operationally, it can therefore be said that, solid waste is any material which comes from domestic, commercial, industrial and institutional sources arising from human activities which has no value to people who possess it and is discarded as useless. Solid waste generated in urban areas is derived from various sources such as households, commerce, institutions, street, construction and industries [13]. In developing countries, up to about two third household wastes consist of organic kitchen wastes. The remainder is composed of sweepings, rags, paper, plastics, rubber, etc. In wealthy areas, discarded furniture, used appliances and garden waste are included. In developing countries however, markets are important sources of commercial waste of which much is

organic matter. Other sources of waste include modern stores, offices, restaurants, hotels and warehouses. Paper is the most predominant waste from most institutional sources like schools, government offices etc. Street sweepings consist of sand, stones and litter. They may also include appreciable amounts of household refuse, drain cleanings, human and animal faecal matter. Construction and demolition activities generate a variety of residual building materials which can contribute significantly to quantities of waste. Industrial wastes from processing and non-processing industries are generated in large quantities and their characteristics relate to the industries and their nature [14].

Sanitation is the state of cleanliness of a place, a community, or a people. In a particular it relates to the quality of life aspect of human health as determined by the psychological factors of the environment. "It is the theory and practice of assessing, controlling and preventing those factors in the environment that can potentially and adversely affect the health of this generation and future generations [15].

Furthermore, various definitions of sanitation to include:

- 1) Safe collection, storage, treatment / re-use of human and animal faeces.
- 2) Practice of sound hygiene behaviour (including hand – washing and household storage of water)
- 3) Management of solid waste.
- 4) Management and re-use of household waste water.
- 5) Drainage of storm water.
- 6) Management of hazardous and industrial wastes [16].

Sanitation is the hygienic means of promoting health through prevention of human contact with the hazard of waste. The hygienic means of prevention can be by using engineering solutions e.g. waste water treatment, Simple technologies e.g. proper use of latrines or even by personal hygiene practices e.g. simple washing with soap. The Community Water and Sanitation Agency (CWSA) define sanitation as hygiene promotion and the disposal of faecal matter and solid waste. Hygiene promotion ensures the use and application of appropriate hygiene practices. Sanitation interventions seek to promote improvements in environmental sanitation and living conditions so as to improve health and productivity [18]. Sanitation is the provision of facilities for the safe disposal of human urine and faeces. It also involves maintenance of hygiene conditions through services such as garbage collection and proper waste disposal. The objective of environmental sanitation is to develop and maintain clean, safe and pleasant physical environment in human settlements to promote the social, economic and physical well-being of people [9].

The provision of sanitary facilities like improved toilet facilities and hygiene improves health status of pupils / students and also encourages girls to attend school. In Bangladesh, a school sanitation project with separate facilities for boys and girls boosted girls' school attendance averagely by 11% per year from 1992 to 1999 [17]. Diseases related to inadequate water, poor sanitation and hygiene are a huge burden in developing countries. It is estimated that 88% of diarrhoeal diseases are caused by unsafe water supply and inadequate sanitation and hygiene. 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 [9].

Schools, particularly those in rural areas, often lack drinking water, hygiene and sanitation facilities, where such facilities do exist, they are often inadequate in both quantity and quality. Schools with poor water, sanitation and hygienic conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's susceptibility to environmental health hazard [9]. Children's ability to learn may be affected by inadequate water, sanitation and hygienic conditions in several ways. These include diarrhoeal diseases and malaria infections, all of which may force many school children to be absent from school. Poor environmental conditions in the classroom can also make both teaching and learning very difficult [17]. Providing adequate levels of water supply, sanitation and hygiene in schools is of direct relevance to the United Nation (UN) Millennium Development Goals of achieving universal primary education, promoting gender equality and reducing child mortality.

Numerous studies show that education and health are inseparable: stunting, nutritional deficiencies, diarrhoea and helminth infections affect school participation and learning. It is well known that stunted children enrol late into school and probably are less likely to complete their schooling with long term consequences for educational performance, outcome and productivity. Importantly, many of these issues can be addressed effectively through health, hygiene and nutrition policies and programs for students and staff. Helminth reduction programmes in schools can have a significant impact on health and learning among school children [19]. The Ghana Education Services (GES) has a School Health Policy which states that schools have to establish School Health Committees to ensure:

- 1) Supervision of sanitation in schools.
- 2) Supervision of the activities of school vendors.
- 3) Provision of good drinking water and sanitation facilities.

4) Proper refuse disposal sites.

5) Provision of hand washing facilities.

6) Development and implementation of health education programmes at schools [20]

Despite all the progress reported worldwide in recent decades, more than 2.3 billion people still live without access to sanitation facilities and are unable to practice such basic hygiene as washing of hands with soap and water. Water-borne diseases related to poor sanitation and water unavailability lead to many people falling ill and even dying. Children are the most vulnerable to health hazards and consequently are affected the most [21]. In 1998, 2.2 million people died because of diarrhoeal diseases of which the vast majority were children. In addition, poor sanitation has led to the infection of nearly a billion people largely children with a variety of worm infections [22].

The impact of poor sanitation and hygiene is known to be disastrous for infants and young children, it also has an important impact on the health of school-age children including adolescents. It is obvious that lack of sanitation and hygiene is a public disaster that deserves the highest priority [17]. Most of the infections which are related to poor sanitation and hygiene are preventable. Diseases such as diarrhoea and parasitic worm infections need to be tackled by making improvements to water and sanitation facilities. However, such improvements must go hand in hand with hygiene behavioural change. Access to sanitation facilities is a fundamental right that safeguards health and human dignity, providing those facilities at schools not only help to meet that right, it also provides the most favourable settings to encourage behaviour change in the school and in the community [23].

Notably, about 400 million school-age children are infected by roundworm, whoop- worm, hookworm, schistosomiasis and other flukes and/or guinea worm, often with multiple species infections. These parasites consume nutrients from children they infect. In doing so they bring about or aggravate malnutrition and retard children's physical development. This can lead to stunting, underweight and anaemia (iron deficiency anaemia, IDA). Schools with poor sanitation and hygiene conditions and intense levels of person-to-person contact are high-risk environments for children and staff, and exacerbate children's susceptibility to environmental health hazard [11]. Children's ability to learn may be affected by poor sanitation and hygiene conditions in several ways and poor environmental conditions in the classroom can also make both teaching and learning very difficult [17].

Every school generates waste arising from routine activities

such as class work, sweeping, serving of food and bush cutting. The common types of solid waste found in various schools may include paper, glass, nylon, polythene bags, plastics, cans, etc. Other forms of wastes may also be found on school premises, and these may not have even been generated directly by pupils and teachers.

School premises are constantly being used, especially on weekends, by churches as meeting places for worship whilst other social activities such as funerals, fanfares, picnics, etc are organised on the school compound. Football matches are played almost every evening on the schools' football fields by youth in the community where some of the schools are located. The school environment sometimes become very dirty and large quantities of waste are left behind by these people. The toilets and the urinal facilities are also used by the people who use the school premises and sometimes make the facility very unhygienic and unhealthy.

The potential health and environmental quality issues associated with poor waste management and insanitary environment in schools have a potential for grave consequences. Open dumping of solid waste generates various environmental and health hazards. The decomposition of organic materials produces methane, which can cause fire and explosion, and contributes to global climate change. The biological and chemical processes likely taking place in open dumps produces strong leachate, which

pollute both surface water and groundwater sources. Fire periodically breaks out in open dumps, generating smoke and contributing to air pollution. Fires often start spontaneously by the methane and heat generated from biological decomposition. In the Mexican city of Tampico for instance, on the Gulf of Mexico Coast, an inferno occurred for over six months at the local open dump [5]

A lot of studies have been conducted which seem to demonstrate the inadequacies in solid waste management and associated problems in the Koforidua Municipality in general [24]. Specifically, a study looked at the problem of waste management in the Municipal Assembly and Policy implementation. The tendency has been to concentrate the previous research work on the whole New Juaben Municipal Assembly with no attention being given to the "educational garbage" in schools in the Koforidua Municipal. Recent studies strongly suggest that school-age children suffer from higher levels of stunting than previously acknowledged. Stunting is increasingly being used as an indicator of population wellbeing and poverty [25]. Estimates from the World Health Organisation global database are that 53% of school-aged children in developing countries are suffering from IDA [26]. When levels of anaemia exceed 40%, it is defined as a public health problem requiring the provision of iron supplements (Table 1).

Table 1. Morbidity and mortality associated with various water and sanitation related diseases [26].

Disease Type	Morbidity (no. of cases each year)	Mortality (deaths each year)	Population at risk
Diarrhoea	<4,000 million	2.5 million	<2,000 million
Amoebic Dysentery	48,000	70,000	Ditto
Cholera	145,000 (1996 data)	10,000 (1996 data)	Ditto
Roundworm	250 million	60,000	Ditto
Hookworm	151 million	65,000	Ditto
Whipworm	43.5 million	10,000	N/A
Guinea Worm	70,000	None	100 million
Trachoma	600 million (6 million blind)	None	500 million
Schistosomiasis	200,000	20,000	600 million

3. Methodology

The research methods chosen for this study are; both qualitative and quantitative (mixed method). The two methods were given equal priority. The methods were combined, both for triangulation and complementarity. Triangulation was used to test the consistency of findings obtained through different instruments used, whilst complementarity clarifies and illustrates results from one method with the use of another method. The population for this study included all the headmasters, pupils and food vendors in the seven basic schools, namely the Seventh Day Adventist (SDA) Demonstration School, Effiduase Methodist

Basic School (EMP), Asokore Methodist Basic School (AMP), Effiduase Catholic Basic School (ECP), Asokore Catholic Basic School (ACP), Christ Complex (CCP) and A. M. E Zion Basic School (AZP) in Koforidua municipality in the Eastern Region of Ghana.

Two hundred respondents were sampled from the seven basic schools. Purposive and simple random sampling techniques were used to select the sample of schools and respondents for the study. Out of the sampled size of two hundred (200) respondents, purposive sampling technique was used to select seven (7) head teachers, twenty-seven (27) food vendors and one hundred sixty-six (166) pupils were randomly selected from the seven basic schools (SDA-24; EMP-23; AMP-26; ECP- 23; ACP-31; CCP-24;

AZP-15). Data Collection was facilitated through the administration of questionnaire, interview and observation. The quantitative data entry and analysis was done by using the SPSS software package. The data was edited, coded and analysed into frequencies, percentages with interpretations. The qualitative data was analysed by the use of the interpretative method based on the themes arrived at during the data collection. The themes were related to the research question and interpreted on the number of issues raised by respondents. These were based on question on the semi-structured interviews.

4. Findings and Discussions

4.1. Environmental Sanitation Awareness of Respondents

It came out very clearly that the people in the study area are aware of the problem of improper sanitary conditions at schools, due to littering and indiscriminate disposal of solid wastes. When the respondents were asked to indicate their knowledge of how they see the problem; the result indicated that approximately 70% of the respondents had enough knowledge of the problem and the seriousness of it. People in developing countries are acutely aware of the municipal solid waste problem.” In 1992 a Gallup survey conducted in 12 developing countries 45% of respondents considered inadequate sanitation and improper garbage disposal as a “very serious” problem. The choice of answers by respondents was augmented by agitation for something to be done about the problem. Most of the respondents demanded immediate actions from designated authorities [27].

4.2. Waste Types and Disposal Methods in Schools

On the issue of the kind of waste that are commonly generated in the schools, majority of the respondents indicated that food wastes, as well as plastic and rubber wastes, were the common types of waste found on school compound. However, apart from the biodegradable and papers, plastic wastes, e-wastes like tube lights, bulbs, paint containers as well as metals and cans are found in the waste stream from schools [8]. In relation to how the waste is disposed off the respondents gave an indication that dumping on refuse dump as well as burning the waste in a shallow pit was the major option available to them. Fires often start spontaneously by the methane and heat generated from biological decomposition [5]. In the Mexican city of Tampico, on the Gulf of Mexico, an inferno occurred for over six months at the local open dump.” Results showed that the waste generated in the schools are put together and dumped at the refuse dumps (figures 1 and 3).

Table 2. Disposal of wastes in schools.

Disposal of refuse	Frequency	Percentage (%)
Contractors (private)	26	13
Dumping on refuse dump	98	49
Land fill	36	18
Burning	40	20
Total	200	100

Forty- nine percent of the respondents confirmed that the waste generated are just left and dumped without any treatment (Table 2). Many unhygienic scenes were found in the environments in the selected schools as depicted in figures 1-4.

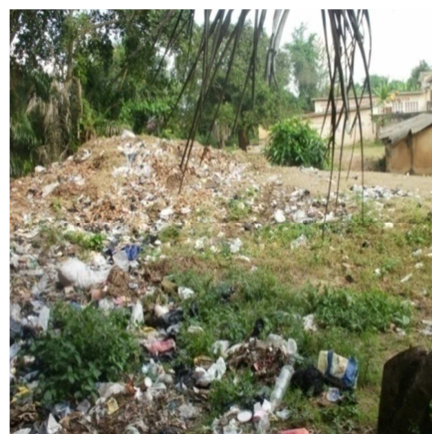


Figure 1. Refuse dump close to a class room block in one of the selected schools.



Figure 2. Unhygienic urinal facility in one of the selected schools.



Figure 3. Children playing close to a refuse dump in one of the schools.



Figure 4. Unhygienic pit latrine used by pupils in one of the selected schools.

4.3. Sanitation Condition in the Schools

On the issue of children's playground, majority of the respondents (75%) indicated that they play on the school compound and around the waste collection bins and the area around the refuse dumps. compound (Figure 5.).

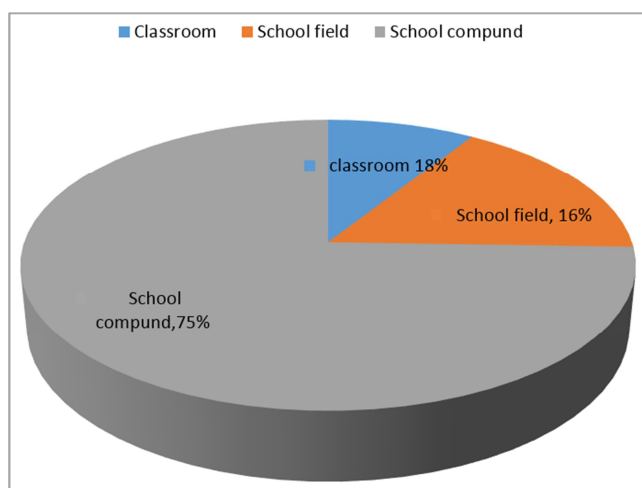


Figure 5. Play ground of children.

This was confirmed during the period of observation as many children were seen playing around the areas mentioned (figure 3). 57.5% of the schools had (KVIP) toilets facilities. The toilet facilities comprise of six- seater KVIP. These were very low compared to the expected 70% by the (Ministry of Education, 2003) meanwhile, 2.5% of the schools had water closet toilet facilities. 5% of schools used public toilets. The toilets were about 250 to 400m away from the schools. Pupils sometimes use the toilet facilities in nearby schools, resulting in the congestion of the facility. The six-seater KVIP were used by each school with enrolment between 200 and 250 pupils. The least number of pupils per squatting hole for the KVIP were about 100 persons per day. These were above the recommended 50 persons per squatting hole by the

Community Water and Sanitation Agency [18]. The pit latrines and the water closet were in poor conditions, (figure 4) unhygienic and unsafe for pupils especially those at the lower primary. There should be a new design for the children at the lower primary level especially with regards to the size of the squatting holes. No school had adequate toilet facilities for the children where the squatting hole was less than 50. The common anal cleansing materials used by pupils were old/used exercised books and these have very serious implications, since the pupils lose materials which should have served as reference materials. All the schools studied had urinals for both boys and girls but the urinals were in unhygienic states with poor drains. This created unhygienic surroundings inside and outside the urinal resulting in odour nuisance (figure 2).

4.4. Solid Waste Facilities

From the study, it was observed that the schools did not have enough dustbins and that the pupils had littered their compounds with solid wastes during school hours thus creating unsightly environmental and insanitary conditions. Dust bins are essential for refuse collections in schools to always ensure good sanitation and hygiene practices and behaviours of pupils [22]. None of the schools visited had adequate hand washing facilities. There were however, some facilities such as communal washing bowls, with towels or napkins, and soaps; where every child washed his/her hands in the same bowl and wiped the hands with the same towel and this increases the chance of disease transmission. The facilities were not adequate and therefore the children in these schools were being denied of proper hygienic practices which could affect their health. The study also revealed that 30.5% of the respondents washed their hand with soaps while 69.5% did not wash their hands with soap before eating. Those who did not wash their hands were at risk of being infected with diarrhoea and worm infections. In addition, they could infect themselves and others with coliform bacteria [18]. The worst hygienic practice carried out was the hand washing after the collection of refuse. Refuse collection with hands is another means of harbouring microbes in the finger nails, especially when the refuse is made up of rotten cabbages, tomatoes and peels of banana. This dangerous actions made the children unhygienic, unsafe and always at risk when they picked refuse from the ground in the morning, especially when it rains. Some of the reasons cited by pupils who washed their hands after visiting the toilets and collecting refuse were to avoid food contamination, to minimize worm infestation through finger nails and this practice by pupils emphasizes the fact that it is good to teach children on good hygienic practices whiles they are young.

4.5. Hygienic Behaviours and Practices of Food Vendors

On the issue of how the food is served to pupils by food vendors, 16 (58%) indicated the use of ladle whilst 11 (42%) indicated with hands (Table 3).

Table 3. Food vendors' hygiene behaviour.

How food is served to pupil	Frequency	Percentage (%)
By the use of ladle	16	58
By the use of hand	11	42
Total	27	100

The study revealed that 58% of food vendors used either ladles or spoons which were always inside the bowl after dishing out food to children while 42% used their bare hands to serve food such as rice. The activities of the food vendors in the schools were not supervised which led to the food vendors' behaviour and practices not being satisfactory. The study also revealed that 32% of the food vendors had been screened while 68% of them had not been screened and this could lead to transmission of communicable diseases from one person to the other [18]. The head teachers that were interviewed indicated that they only inspect the food vendors' certificates after which they are allowed to sell on the schools' compound. It was also discovered that the environmental health officers did not frequently inspect vendors' certificates for renewal and this enables some of the people who do not have certificates to sell. This practice could lead to the sale of unwholesome food products in the school with its attendant problems.

5. Conclusions and Recommendations

The study revealed that there were poor sanitary conditions and indiscriminate disposal of solid waste in the schools because bins were not adequate and poorly hygienic. The study also concluded that, the activities of food vendors and other traders in the schools were not clearly monitored frequently and the teachers did not show concern about the kind of foods that were sold on the compound. This gives room to those who do not possess the permits to sell thereby jeopardizing the health of the pupils. The study also revealed that, all the selected schools did not have adequate proper toilets and urinal facilities and this created unhygienic surroundings inside and outside these facilities resulting in odour nuisance. The odour and houseflies produced from the toilets and the urinal do not auger well for the selected schools, none of the schools had proper hand washing facilities prescribed by the Ghana Education Service (GES), though there were some facilities such as communal hand washing bowls with towels or napkins where every child

washed his/her hands in the same bowl and used the same towel or napkin to wash his/her hands.

It is recommended that, Sanitation, hygienic and health education should be carried out in schools to sensitize pupils understanding on the dangers of poor sanitation. District Environmental Health officers should be contacted for their expertise on the location of the school's toilets, urinary, refuse dumps sites and canteens to reduce odour nuisance on school compound. It is further recommended that, proper hand washing facilities, such as veronica buckets, soap and tissues should be provided to promote proper hand washing in schools. However, in order to improve access of hand-washing in the schools, these facilities should be closer to latrines and eating-places. The improved hand-washing can have major positive impact on public health and significantly reduce diarrhoea disease and acute respiratory infection. It can also reduce skin infection and trachoma since hand washing with soap can prevent the transmission of a variety of pathogens.

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