World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

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Analysis of hygienic and sanitary conditions in the primary schools of Kisangani in The Democratic Republic of Congo

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World Journal of Advanced Research and Reviews, 2025, 27(01), 141-152

Publication history: Received on 29 March 2025; revised on 12 June 2025; accepted on 14 June 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.27.1.1702

Abstract

Introduction: The health and well-being of children are fundamental elements of education, because the cleanliness of the child is no less necessary than that of the school. Indeed, active health promotion has become a priority for schools. Specifically, the study aims to analyze the hygienic and sanitary conditions in primary schools in the city of Kisangani; and to identify their repercussions on the health of pupils.

Methods: This is a descriptive study with a cross-sectional aim, based on direct observation and interview. Forty-seven schools were targeted, for which we randomly selected 10 schools that made up our sample (5 Accredited private school, 3 Approved schools and 2 Official schools) distributed in the different districts of the commune of Kabondo.

Results: It emerged that 55.0% of respondents maintain that school toilets are dirty; Using ordinary toilets (53.3%), trash can (41.3%), paper (24.7%) and brush (22.3%) are the equipment used in school toilets. Due to a lack of equipment, 38.3% never wash their hands after washing. Classrooms are cleaned three times a week (45.0%). Poor hygiene in school sanitation facilities is one of many predictors for the emergence of communicable diseases.

Conclusion: Schools that do not have sanitation facilities, or those whose facilities are poorly maintained or used, become risk environments conducive to disease transmission. There is a need for a better hygiene and sanitation policy in schools in order to safeguard the health of schoolchildren.

Keywords: Look; Conditions; Hygiene; Sanitary; Primary School

1. Introduction

The subject of hygiene at school must no longer be a taboo subject, it is absolutely necessary to get out of the unspoken and the mutual reproaches between the different actors to address together locally all the aspects that affect the hygiene and health of children and adults in the making. Lack of hygiene is often reported as a health problem to be taken with great caution. It is essential to equip the sanitary facilities with toilet paper, soap, a hand drying system, and bins specific to the girls' toilets [1].

According to Ferrand [2], hygiene and safety in school toilets is a public health issue that concerns both the local authorities that own the schools and the representatives of the national education system operating the buildings, users, parents, doctors and, of course, pupils. These places are often the cause of accidents and health problems in the event of insufficient hygiene and privacy.

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Adams et al [3] consider that hygiene and sanitation conditions in schools affect not only the health status of pupils, but also of the population. The lack of access to drinking water and sanitation facilities and the low level of adoption of appropriate hygiene behaviors and practices encourage water-related and unhealthy diseases such as diarrhea, trachoma and dermatoses, which are major public health problems. This can affect children's school attendance and ability to learn. Orianne [4] indicates that hygiene at school does not only concern pupils and infrastructure. The people who maintain the premises must also protect themselves. Marianne [5] considers that more than half of nursery and primary schools in developing countries do not have water and sanitation services. Today, on World Toilet Day, let's look at how increased access to education is closely linked to the availability of decent toilets in schools.

According to UNICEF [6], in many countries, water- and sanitation-related infections have a high prevalence, causing illness or even death for many people, especially children. Improved hygiene habits are essential to limit the transmission of water and sanitation diseases. Although hygiene education can lead to the intention to change behavior, there is only a shift from intention to action when people have the right water and sanitation facilities.

The occurrence of a communicable disease in schools should be an opportunity to review hygiene measures and their application to prevent secondary cases or an epidemic. The application of hygiene rules is still essential in the prevention of diseases that can be transmitted in communities: it makes it possible to fight against the sources of contamination and to reduce the means of transmission. Strict application of these measures prevents contamination by infectious agents and prevents their spread. Good hygiene practices must therefore be regularly reiterated within the school by the principal and in the classroom by the teacher [7].

In the Democratic Republic of Congo, a survey was carried out among 500 pupils (254 girls and 246 boys) in order to assess the hygiene conditions in schools in the sub-division of Madimba (Kongo-Central Province, DR Congo). The study shows that 21 schools (65.6%) each have a functioning water point. In 91% of cases, anal cleaning equipment was absent in sanitary facilities; 78.1% of latrines smelled bad and 22 schools have unhygienic latrines; 18 schools (56.2%) are fleeing garbage or throwing it in a hole. Few schools carry out hygiene promotion activities from school to community; 74 pupils (14.8%) have their hygiene education manual; 4.6% of pupils know the vectors that transmit diarrheal diseases from the faecal peril. Eighty-nine pupils (17.8%) are familiar with waterborne disease prevention methods; 73% of pupils appreciated their latrine not clean and 40.6% of pupils noticed the presence of open defecation in their schools [8].

Indeed, some kindergartens in Kisangani offer a clean, welcoming and attractive appearance to their entrance. But a simple visit to the school space makes it possible to realize the existence of piles of rubbish, including the typology of waste. These piles of waste are mostly hidden in the nooks and crannies of the schoolyard. The sanitary facilities are not spared. Defecation sprinkled with urine floods the toilets to the point of clogging bidets. In addition, the children relieve themselves everywhere and sometimes pour water into them afterwards.

A reflection must be initiated within the school council to find the equipment best suited to the school population, in particular on the elimination of Turkish-style toilets and endless towels on rolls. The question arises as to the maintenance of urinals in nursery and elementary schools in view of hygiene rules and respect for privacy.

The main aim of this study is to promote the maintenance of hygiene in schools in order to preserve better health for pupils and school staff. Specifically, the present study aims to analyze the hygienic and sanitary conditions in primary schools in the city of Kisangani; and to identify their impact on the health of pupils.

2. Methodology

2.1. Materials

2.1.1. Description of the research area

We conducted our study in the Commune of Kabondo, which is one of the six communes that make up the city of Kisangani. The other five are the communes of Kisangani, Lubunga, Mangobo, Makiso and Tshopo. It was born from the extra-customary Center called "Brussels" in the 1930s during the colonial era.

The commune of Kabondo is located at latitude of 0 degrees 31' north of the equator and a longitude of 25 degrees 11' east of the Greenwich meridian. Its altitude, like that of the city of Kisangani itself, is 440 m above the sea and its surface area is 386 km^2. The total population of the commune of Kabondo is 123,513 inhabitants according to the 2013 statistics. This municipality has 20 Wards, 52 Blocks and 192 Avenues.

2.1.2. Brief Historical Overview

Originally, this indigenous city consisted of two large parts that make up its configuration to this day, namely the part called Brussels which constituted the old city and the part called Transversal or "Trans" which was formed by extension of Brussels following the galloping demographic pressure favored by the rural exodus and the attraction of the city's wonders.

The Commune of Kabondo acquired the status of a decentralized administrative entity with legal personality in 1958 by Ordinances Nos. 24 and 25 implemented by Ministerial Order No. 58/62 of July 28, 1958. It derives its current status as a decentralized territorial entity from the provisions of paragraph 2 of article 3 of the Constitution of the Democratic Republic of Congo of 16 February 2006 and implemented by Organic Law No. 08/016 of 7 October 2008 on the composition, organization and functioning of decentralized territorial entities and their relations with the State and the Provinces.

2.1.3. Geographical location

With regard to geographical delimitation, the Commune of Kabondo shares its boundaries to the east with the Kilanga Quarter in the Kisangani Commune; to the west with the Boyoma Plateau district in the Makiso Commune; to the north with the Kilanga district in the Kisangani Commune and to the south with the Kandolo district of the Tshopo Commune and the Lubuya-Beira Collectivity-sector.

2.1.4. Population and Study Sample

The population under study was made up of 47 Primary Schools in the Commune of Kabondo in the city of Kisangani. These are of course the schools that we targeted during our survey on the analysis of hygienic and sanitary conditions in primary schools.

From this target population, we drew a weighted stratified sample of 10 primary schools using the ballot box technique. This technique consists of defining subgroups in our population at the outset where the size of each of them will be proportional to the presence of the trait it represents in the total population. As such, each individual or each school in our case has the same chance of being included in the sample.

To achieve this, we first drew up a list of primary schools numbered from 1 to 47 functional schools in the commune of Kabondo of course, belonging to the different education Sectors. In addition, we have prepared tokens numbered according to the number of schools to be observed.

Considering the 47 targeted schools, we randomly selected 10 schools that made up our sample, i.e. 5 accredited private school, 3 Approved schools and 2 Official schools spread over the different districts of the municipality of Kabondo. Of these 10 primary schools, we have the following breakdown by Sector

- Accredited Private Sector: 5 schools, i.e. 50%;
- Approved Sector: 3 schools, i.e. 30% and;
- Official Sector: 2 schools, i.e. 20%.

Thus, the sample size is estimated at 300 pupils in 10 schools targeted as follows: Accredited Private Sector 150 pupils, Approved Sector 90 and Official Sector 60 pupils.

2.2. Methods and techniques

2.2.1. Type of study

This is a descriptive study with a cross-cutting aim, conducted in the primary schools of the Commune of Kabondo from January 15, to March 31, 2025.

2.2.2. Data collection technique

We used the technique of direct observation. This technique gave us the opportunity to go down to the field in order to see the hygienic and sanitary conditions of primary school pupils in the commune of Kabondo in Kisangani.

We also used direct interviewing, this technique consists of orally asking questions to a person or a group of people (usually the respondents); the answers provided by the latter are immediately entered on the data collection form during the interview or after it.

2.2.3. Data processing technology

The data collected were aggregated and presented in the form of absolute frequency tables and then transformed into a percentage for analysis and processing. We also calculated the average to analyze a few variables such as age.

3. Results

3.1. Identification of Respondents

Table 1 Distribution by respondent identifiers

Variables analyzed		Accredited private school		Approved school		Official School		Total	
		n	%	n	%	n	%	n	%
Age/Year	5 – 7	24	8.0	33	11.0	31	10.3	88	29.3
	8 – 10	75	25.0	30	10.0	17	5.7	122	40.7
	11 – 13	51	17.0	27	9.0	12	4.0	90	30.0
Sex	Male	55	18.3	61	20.3	12	4.0	128	42.6
	Female	95	31.7	29	9.7	48	16.0	172	57.4

The analysis of this table shows that 122(40.7%) of the subjects in the study are between 8 and 10 years old, among whom a high rate is observed in schools in the accredited private Sector 75(25.0%), and that the female sex predominates 172(57.4%) with a peak in schools in the private Sector 95(31.7%).

3.2. Type of school toilets in schools

Table 2 Distribution in relation to the type of school toilet

Sector / Type of toilet	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Modern toilet	53	17.7	65	21.7	22	7.3	140	46.7
Regular toilet	97	32.3	25	8.3	38	12.7	160	53.3
Total	150	50.0	90	30.0	60	20.0	300	100

It emerges from this table that 160(53.3%) of respondents say that schools use ordinary toilets, including 97(32.3%) for schools in the Approved Private Sector against 25(8.3%) for schools in the Approved Private Sector. However, we observed that only the Sector of Approved Schools uses a large number of modern toilets 65(21.7%).

3.3. Equipment used in school toilets

Table 3 Distribution according to the equipment used in the school toilets

Sector / Equipment	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Liquid soap	0	0.0	35	11.7	0	0.0	35	11.7
Paper	42	14.0	20	6.7	12	4.0	74	24.7
Brush	25	8.3	17	5.6	25	8.3	67	22.3
Drier	0	0.0	0	0.0	0	0.0	0	0.0
Hand towel	0	0.0	0	0.0	0	0.0	0	0.0
Dustbin	83	27.7	18	6.0	23	7.7	124	41.3
Total	150	50.0	90	30.0	60	20.0	300	100

It follows from this table that bin 124(41.3%), paper 74(24.7%) and broom 67(22.3%) are the most used equipment in school toilets, with 83(27.7%) respectively for the Approved Private Sector using the bin. Liquid soap is only used in the toilets of the Approved Sector 15(5.0%).

3.4. Frequency of use of school washrooms by pupils

Table 4 Distribution of Study Subjects by Frequency of Use of School Washrooms

Sector / Frequency	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Every day	55	18.3	36	12.0	33	11.0	124	41.3
Occasionally	27	9.0	29	9.7	15	5.0	71	23.7
Never	68	22.7	25	8.3	12	4.0	105	35.0
Total	150	50.0	90	30.0	60	20.0	300	100

In view of this table, we note that 124 (41.3%) of the subjects in the study use the toilets built in their respective schools every day, while 71 (23.7%) use them occasionally and 105 (35.0%) never use the school toilets.

3.5. Cleanliness of School Washrooms

Table 5 Distribution according to the state of cleanliness of school toilets

Sector / Toilet condition	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Clean	54	18.0	63	21.0	18	6.0	135	45.0
Dirty	96	32.0	27	9.0	42	14.0	165	55.0
Total	150	50.0	90	30.0	60	20.0	300	100

An analysis of this table shows that 165(55.0%) of the respondents say that school toilets are dirty, compared to 135(45.0%) who say that they are clean. In addition, it is in the Approved Sector that we find a high rate of hygienic toilets that are clean, i.e. 63(21.0%).

3.6. Frequency of hand washing after washing

Table 6 Distribution according to the frequency of hand washing after washing

Sector / Hand washing	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Always	27	9.0	43	14.3	13	4.3	83	27.7
Sometimes	37	12.3	32	10.7	33	11.0	102	34.0
Never	86	28.7	15	5.0	14	4.7	105	38.3
Total	150	50.0	90	30.0	60	20.0	300	100

It appears from the observation of this table that most of the respondents 105(38.3%) never wash their hands after washing, and that a low rate of pupils 83(27.7%) admit that they wash their hands after washing. However, in the Sector of Approved Schools, the frequency of hand washing after washing remains high, at 43(14.3%).

3.7. Existence of water points outside school toilets

Table 7 Distribution according to the existence of water points outside school toilets

Sector / Opinion	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Yes	60	20.0	62	20.7	12	4.0	134	44.7
No	90	80.0	28	9.3	48	16.0	166	55.3
Total	150	50.0	90	30.0	60	20.0	300	100

A reading of this table shows that 166(55.3%) of the subjects in the study stated that there are no water points outside school toilets and that only the Approved Sector has water points outside toilets had 20.0% of approved private schools that have a source of supply, i.e. 62(20.7%).

3.8. Intestinal or urinary problems presented by pupils

Table 8 Distribution of the subjects of study according to the intestinal or urinary problems presented by the pupils

Sector / Opinion	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Acute constipation	52	17.3	25	8.3	21	7.0	98	32.6
Urinary tract infection	98	32.7	65	21.7	39	13.0	202	67.4
Total	150	50.0	90	30.0	60	20.0	300	100

The data mentioned in this table indicate that 202(67.3%) of pupils say they have experienced the Urinary Tract Infection (UTI) problem, compared to 98(32.6%) who have had acute constipation.

3.9. Frequency of stomach aches due to lack of hygienic toilets

Table 9 Distribution according to the frequency of stomach aches due to lack of hygienic toilets

Sector / Frequency	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	%
Very often	74	24.7	12	4.0	22	7.3	108	36.0
Often	32	10.7	18	6.0	18	6.0	68	22.7
Sometimes	28	9.3	38	12.7	12	4.0	78	26.0
Never	16	5.3	22	7.3	8	2.7	46	15.3
Total	150	50.0	90	30.0	60	20.0	300	100

A close look at this table is enough to note that a large number of respondents, 108(36.0%) very often suffer from stomach aches as a result of lack of school toilet hygiene, compared to 46(15.3%) who say they have never felt stomach aches.

3.10. Size of the School Yard

Table 10 Distribution by size of school yard

Sector / Dimension	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	100
Sufficient	60	20.0	63	21.0	42	14.0	165	55.0
Reduced	90	30.0	27	9.0	18	6.0	135	45.0
Total	150	50.0	90	30.0	60	20.0	300	100

An examination of this table shows that the size of the school yard is sufficient for 165(55.0%) schools, especially for schools in the Official Sector and the Approved Sector, i.e. 42(14.0%) and 63(21.0%) respectively. On the other hand, the schools in the Approved Private Sector have relatively small school classes in the majority of cases, i.e. 90(30.0%).

3.11. School Environmental Hygiene

Table 11 Distribution according to the environmental hygiene of schools

Sector / Hygiene	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	100
Good	90	30.0	45	15.0	19	6.3	154	51.3
Fairly good	35	11.7	27	9.0	8	2.7	70	23.4
Bad	25	8.3	18	6.0	33	11.0	76	25.3
Total	150	50.0	90	30.0	60	20.0	300	100

The content of this table reveals that the environmental hygiene of schools is good for 154(51.3%) and that it is bad for 76(25.3%). It should also be noted that the rate of sanitation is higher in schools in the approved private Sector with 90(30.0%) and in schools in the Approved Sector 45(15.0%) and that the Sector of Official Schools remains for most cases less clean in its environment.

3.12. Classroom Cleaning Frequency

Table 12 Distribution according to the frequency of classroom cleaning

Sector / Frequency	Accredited private school		Approved school		Official School		Total	
	n	%	n	%	n	%	n	100
Every day	42	14.0	49	16.3	12	4.0	103	34.3
2 times a week	73	24.3	20	6.7	35	11.7	128	42.7
3 times a week	35	117	21	7.0	13	4.3	135	45.0
Total	150	50.0	90	30.0	60	20.0	300	100

It emerges from this table that 135(45.0%) of respondents say that classrooms are cleaned three times a week against 103(34.3%) who admit that classrooms are cleaned every day, especially in schools in the Approved Sector with a high rate of 49(16.3%).

4. Discussion

Regarding age and sex, it emerges from this series that 122(40.7%) of the subjects in the study are aged between 8 and 10 years old and that the female sex predominates 172(57.4%) with a peak in schools in the private Sector 95(31.7%). The result of our study is contrary to the literature of the report published by UNICEF [6] which emphasizes that the gross attendance rate of children in primary school is 69% for boys and 31% for girls, from which the slogan "All girls in school" came from, because African culture in general and Congolese culture in particular do not promote girls' schooling so much.

In Kisangani and throughout The Democratic Republic of Congo, we have observed so far that the Congolese population has not yet understood the validity of this slogan, because schooling is much more granted to boys than to girls, and the current situation also favors the non-schooling of girls compared to boys. This in a way promotes early marriages and unwanted pregnancies in most communities.

Regarding the type of school toilets, we found that 160(53.3%) of respondents said that schools use ordinary toilets, including 97(32.3%) for schools in the Approved Private Sector compared to 25(8.3%) for schools in the Approved Private Sector. However, we observed that only the Sector of Approved Schools uses a large number of modern toilets 65(21.7%). The result of our study corroborates that found by Berthet E. [9] who also observed that 56.3% of primary school pupils in the city of Kisangani use ordinary toilets. Similarly, Douady and Palassy [10] offer a toilet for 20 female pupils but for 26 boys. We consider that school officials should in principle provide the school community with modern toilets with hygienic conditions observed and condition the number of pupils with the number of toilets because children cannot bear to keep the needs of going to the toilet like adults and also this would have a negative impact on their health.

Regarding the equipment used in school toilets, we found that bin 124(41.3%), paper 74(24.7%) and brush 67(22.3%) are the most used, with 83(27.7%) respectively for the Approved Private Sector using the bin. Liquid soap is only used in the toilets of the Approved Sector 15 (5.0%).

A study by Gaulin [11] reported that the absence of paper in the toilet led to the occurrence of vulvitis and urinary tract infections that boys refrained from having a bowel movement, which caused constipation and abdominal pain, making school life difficult and disrupting learning. UTIs are much more common in girls and constipation problems are slightly more common in boys. Girls (23.1%) visit their doctor more often than boys (14.7%). Similarly, Adams et al [3] report in their study that washrooms are not equipped with washbasins in 44 schools. The sanitary facilities in 12.8% of schools are not equipped with soap and in 9.5% of schools there is no soap, hand towels or hand dryers or paper towels. There is no toilet paper available to children in 48 schools and in 30 of them; the toilets are not equipped with toilet paper and toilets.

It is essential to make hygienic facilities safe by using appropriate equipment to maintain hygiene. The use of liquid soap is particularly essential for hand washing after the toilet to combat dirty hand diseases such as typhoid fever and cholera. However, other equipment remains essential for the healthy maintenance of school hygiene facilities.

The use of hygienic systems is ideal when there is a natural need. In this series, we found that the frequency of using school toilets varies depending on the case: 124(41.3%) of the subjects in the study use the school toilet every day, while 71(23.7%) use it occasionally and 105(35.0%) never use the school toilet. According to Morin [12], boys use the toilet more regularly than girls and their judgment is no different from that of girls. Fear is particularly felt by one in five girls (21.3%) while 7.8% of boys express it. We believe that the lack of hygiene in school sanitation facilities causes pupils not to attend them regularly for fear of becoming infected with diseases. This would expose them to diseases such as urinary tract infection by holding urine for as long as possible.

Addressing the point on the state of cleanliness of school toilets, we noted that 165 (55.0%) of respondents maintain that school toilets are dirty, compared to 135(45.0%) who say that they are clean. In addition, it is in the Approved Sector that we find a high rate of toilets that are clean, i.e. 63(21.0%). This is not the case in other studies in DR Congo and elsewhere. According to Averous [13], French teachers say that the cleanliness of toilets is satisfactory in more than three-quarters of schools (80.7%), but ventilation is not satisfactory in 65.9% of schools. The result of the study conducted by Adams et al [3] highlights that the most frequent remark of children concerns the smell considered bad by nearly three-quarters of them (72.9%). Lack of cleanliness is reported by 57% of children. Overall, they complain relatively little about lighting (22%) and heating (30%), but more than half of them consider the toilets to be unwelcoming (50.4%).

In the Democratic Republic of Congo, this situation was noted by Pangodi et al [8] in Madimba (Kongo Central Province) where, in 91% of cases, anal cleaning equipment was absent in sanitary facilities; 78.1% of latrines smelled bad and 22 schools have unhygienic latrines; 18 schools (56.2%) are fleeing garbage or throwing it in a hole. We believe that schools with poor water, sanitation and hygiene conditions and high levels of contact between individuals are a high-risk environment for pupils and staff alike, increasing children's vulnerability to environmental health risks.

In this study, we noted that most respondents 105(38.3%) never wash their hands after washing, and that a low rate of 83(27.7%) pupils admit that they wash after washing. However, in the Sector of Approved Schools, the frequency of hand washing after washing remains high, at 43(14.3%). Systematic handwashing is an important factor in the fight against dirty hand diseases.

The schools of the approved Sector, especially those created by the Catholic Church, have always been particularly healthy in all details. Hygiene conditions are generally observed, which offers a good image in safeguarding the health of schoolchildren and teaching staff. On the other hand, hygienic conditions are not observed in the schools of the Official Sector under the supervision of the public authority where there is an almost total lack of interest. These schools receive almost no state subsidies for their operation. The policy of free public schools does not at all encourage the emergence of these schools, which feel abandoned to their sad fate.

The existence of water points outside school toilets is also very important. In this series, we observed that 166(55.3%) of the subjects in the study stated that there are no water points outside school toilets and that only the Approved Sector has water points outside toilets had 20.0% of approved private schools that have a water source, i.e. 62(20.7%). The lack of water in the schoolyard can be a factor in the spread of disease. According to UNICEF [6], these diseases can be prevented by providing drinking water, proper disposal of wastewater, excreta, household waste, good food hygiene practices and health education for the population.

According to Ntsebe [14], among these diseases, digestive parasitosis occupies a prominent place among schoolchildren. The way in which they are contaminated depends on the particularities of each parasite's life cycle. Thus, *Trichocephalosis* and pinworm, colonic parasitosis, ascariasis, and small bowel parasitosis, are mainly found in school-age children. They are contracted by ingesting embryonated eggs. For ascariasis and whipworm, it is necessary that the eggs emitted in the faeces of an infested subject have been in the external environment for a certain time in order to become infectious. There is therefore no self-infestation as in pinworms.

We believe that improved hygiene habits are essential to limit the transmission of water and sanitation-related diseases, in short, to the lack of hygiene in schools.

Regarding intestinal or urinary problems, 202(67.3%) of pupils say that they have experienced the problem of urinary tract infection, compared to 98(32.6%) who have had acute constipation. According to Dornier [15], boys use the toilet more regularly than girls and their judgment is no different from that of girls. Fear is particularly felt by one in five girls (21.3%) while 7.8% of boys express it. UTIs are much more common in girls and constipation problems are slightly more common in boys. Girls (23.1%) visit their doctor more often than boys (14.7%).

Hygiene and safety in school toilets is a public health issue that concerns both the local authorities that own the schools and the representatives of the national education system operating the buildings, users, parents, doctors and, of course, pupils. These places are the cause of accidents and health problems in the event of insufficient hygiene and privacy. Consultation between the different actors is the only method to find a solution between sometimes contradictory interests.

We found that a large number of respondents, i.e. 108(36.0%), very often suffer from stomach aches as a result of the lack of school toilet hygiene, compared to 46(15.3%) who say they have never felt stomach aches.

In India, a survey of schoolchildren found that about half of the infections recorded were due to poor sanitation and lack of personal hygiene. Such results show the need to focus on children. In addition, it is generally considered that childhood is the best time to learn hygienic behaviors. Children are the parents of tomorrow and what they learn is likely to be applied for the rest of their lives [6].

We believe that the subjects in the study had knowledge of the repercussions related to the lack of hygiene in the school environment. Although hygiene education can lead to the intention to change behavior, there is only a shift from intention to action when people have the right water and sanitation facilities.

Regarding the size of the school playground, it appears that the size of the school playground is sufficient for 165(55.0%) of schools, especially for the schools of the Official Sector and the Approved School, i.e. 42(14.0%) and 63(21.0%) respectively. On the other hand, the schools in the Approved Private Sector have relatively small school classes in the majority of cases, i.e. 90(30.0%). According to Orianne [4], hygiene at school is not only about pupils and infrastructure. The people who maintain the premises must also protect themselves. For this purpose, there are special equipment such as household protective gloves. Cleaning staff should also have all the necessary equipment to carry out their work, including the shovel and brush kit, bucket, a professional mop and a broom. According to Morin [12], children need a healthy environment for their health. The degradation of this environment has serious consequences. The degradation of this environment has harmful effects on children, who are the most exposed segment of the population. As proof, 14 million children under the age of five die each year in developing countries because of environmental hazards such as pollution, malaria, malnutrition, diarrheal diseases and measles.

We believe that all these environmental factors that threaten the health of pupils can be improved by a well-established health education program involving pupils, teachers, saleswomen and health educators.

When addressing the issue of environmental hygiene in schools, most respondents say that it is good in 154(51.3%) and that it is bad in 76(25.3%). It should also be noted that the rate of sanitation is higher in schools in the approved private Sector with 90(30.0%) and in schools in the Approved Sector 45(15.0%) and that the Sector of Official Schools remains for most cases less clean in its environment.

According to Averous [13], specific hygiene education is not provided in 1 in 4 schools (26.8%). 15.5% of teachers' remarks relate to insufficient cleaning. They want it to be carried out at least 2 times a day and for the normally ventilated premises to be ventilated regularly because of the bad smells. Regarding potty training, 7 teachers report significant improvements in the state of sanitation after pupils have been made responsible. A request for educational aid has been made (annual campaign with the provision of posters and stickers on the subject). The government's inability to subsidize public sector schools on a regular basis has led to serious problems with their smooth operation; As a result, some essential aspects such as the environmental hygiene of schools are placed in the background.

Regarding the frequency of classroom cleaning, it emerges from this study that 135(45.0%) of respondents say that classrooms are cleaned three times a week against 103(34.3%) who admit that classroom cleaning is done every day, especially in schools in the Contracted Sector with a high rate of 49(16.3%).

According to Flamant [16], it is not enough to ensure good hygiene in the classroom where the child will stay for several years on a daily basis, for a certain number of hours: the occupant himself must also meet certain sanitary conditions that are essential both for the preservation of his own health and to prevent him from becoming a danger to the health of his little friends. The teacher will have to be well acquainted with these conditions: for if, in questions of construction, or of material arrangement, he can, most often, only express wishes, here, on the contrary, his initiative, his science, his devotion can be exercised freely.

In primary and elementary schools, the premises must be cleaned daily and there must be sufficient ventilation to keep them in a state of health. The children are also encouraged by their teacher to practice order and hygiene on a daily basis.

5. Conclusion

Lack of hygiene is often reported as a health problem to be taken with great caution. It is essential to equip the sanitary facilities with toilet paper, soap, a hand drying system, and bins specific to girls' toilets. Hygiene and sanitation conditions in schools influence the state of health of pupils, but also of the population.

From a general point of view, the schools in the commune of Kabondo do not give a good impression in terms of health. Sanitary facilities are unsanitary, and the school environment leaves much to be desired. There is a need for a better hygiene and sanitation policy in schools in order to safeguard the health of schoolchildren.

Compliance with ethical standards

Disclosure of conflict of interest

The authors believe that there is no conflict of interest in the conduct of this study.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Contributions

All authors were involved in the study design, data collection, and analysis. They take full responsibility for all aspects of the study.

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