
Assessment of Hygienic Practices Among Primary School Pupils in Mwanza City

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Abstract: Despite the efforts done by the Government of the United Republic of Tanzania and other private entities to provide hygienic education and support the construction and improvement of hygienic infrastructures in many government schools, the issue of hygiene in majority of the primary schools is still questionable. Feces and urine are not properly disposed of into the pits in most of the primary schools. During the study, it was observed that despite the presence of hand washing facilities in most schools, a number of pupils were found not washing their hands when they came out from the latrines. Rarely, a few pupils were observed washing their hands with clean water and soap after using the toilets. Thus this study aimed to investigate the general knowledge and perception of the pupils on general hygiene as well as to assess the factors that can be associated with the hygienic practices. A cross sectional survey was conducted with a sample size of 792 primary school pupils in Mwanza city. To avoid excuses, the study deployed only public schools which had access to water and had the hand washing facilities installed. The study found out that majority, 773 [97.6%] out of 792 pupils reported to be aware on general hygiene, 630 pupils [79.6%] had a positive perception and only 424 [53.5%] reported to wash their hands with soap and water after they use the latrine. Generally, majority of the pupils participated in this study reported to be aware on general hygiene. Majority of the participants also had a positive perception on hygienic practices. Hygienic practices were associated with location of schools in municipalities and perception of individuals. The study recommends that the stakeholders should continue with the provision of hygienic education and especially on the impact of the poor hygienic behavior.

Keywords: Knowledge, Perception, Hygienic Practices

1. Introduction

Hygienic practices cannot be separated from the availability of water and sanitation facilities. Hygienic practices include proper use of latrine and hand washing practice with clean water and soap after visiting latrines. Inadequate sanitary conditions and poor hygiene practices play a major role in the increased burden of communicable disease within developing countries [1]. When not well addressed, poor hygienic practices result in a number of diarrhea diseases. Infectious agents which are associated with diarrheal diseases are transmitted through a fecal – oral route [2]. In developing countries, it is estimated that 94% of the disease burden is attributed by environmental factors which include unsafe water, poor sanitation and hygiene [3]. School pupils aged 5–15 years suffer the highest infection rate and

worm burden which is attributed to poor sanitation and hygiene [4].

Worldwide, there are a number of challenges facing individuals and nations with regards to hygienic practices. A study by UNICEF/ WHO established that globally, more than 850 million people lack access to a water supply while more than 2.5 billion lack access to sanitation facilities [5]. Studies have revealed that, worldwide, there is failure to provide even the most basic water services for billions of people which resulted into devastating human health problems [6].

Improving global access to clean and safe drinking water and safe sanitation is one of the least expensive and most effective means to improve public health and save lives of individuals [7]. According to UNICEF report, hand washing with soap can have the highest impact to reduce disease transmission for example of diarrhea by about 47% while

sanitation can reduce the impact of diarrhea by about 36% [8].

In developing countries, water and sanitation is still a problem and as a result millions suffer from preventable diseases and die every year. The problem of water and sanitation is much worse in sub Saharan Africa in which 42% of the population lack access to improved water while 64% lack access to improved sanitation, therefore deaths due to diarrhea diseases are greater than in any other region [6].

According to a study on mapping of school water, sanitation and hygiene [WASH] done by SNV in collaboration with UNICEF and water Aidin 2009, which covered a total of 2,697 primary and secondary schools in sixteen districts of Tanzania, only 11% of schools surveyed meet the Ministry of Education and Vocational Training [MoEVT] minimum standards of 20 girls and 25 boys per drop hole [9], 20% of schools have more than 100 pupils per drop hole and 6% of schools had no latrines at all, 96% of schools have no facilities that are suitable or accessible to children with disabilities, 52% of girls latrines did not have doors for providing dignity and privacy. Despite the lifesaving potential of hand washing practice, 92% of schools did not have functional hand washing facilities with water and 99% did not have soap. 62% of schools in these districts reported having access to pipe water or another protected water supply though this wasn't regular or sufficient quantity [10]. In that study, it was also noted that school water, sanitation and hygiene [SWASH] was poor due to the fact that four ministries were involved in it and hence lack of proper coordination and accountability.

School pupils play an important role in transforming hygienic behavior within community. Poor hygiene and sanitation in schools can increase health risks including diarrhea, worms and urinary infections which can impact children ability to learn and could result in increased absenteeism. Poor attendance can result into poor performance which may possibly lead to early dropout from school [11].

Following the study by SNV, UNICEF and Water Aid, a number of initiatives were established to improve school water, sanitation and hygiene [SWASH] situation in Tanzania. These include signing of a Memorandum of Understanding [MoU] between 4 key ministries namely MoEVT, PMO-RALG, MoHSW and MoWI, establishment of the National Technical Working Group for school WASH [SWASH-TWG] to be co-chaired by MOEVT & MOHSW, A national strategic plan for school WASH [2012 – 2017] and the National guidelines for SWASH which have been jointly developed by the four key ministries with technical support from SNV, Water Aid, Ardhi University, Muhimbili University of Health and Allied Sciences and a wide range of other civil society organizations [10].

However, despite all these studies and initiatives on improving SWASH, little has been discussed with regards to the factors associated with hygienic practices especially in primary schools pupils hence this study will investigate the factors, knowledge and perception of the pupils on hygienic practices.

Despite a number of studies which have been carried out with regard to water availability, hygiene and sanitation, little has been mentioned with regard to the factors contributing to hygienic practices among primary schools pupils.

A reconnaissance survey that was undertaken in some primary schools in Mwanza city revealed that most primary schools have both latrines and hand washing facilities. However, despite the presence of latrines and hand washing facilities, some pupils were observed walking out of the latrines without passing through the hand washing facilities to clean their hands. In some schools, it was also observed that the environment outside the latrine building was dirty with a smell indicating that some pupils were either urinating or defecating outside.

Good hygiene practices are not only influenced by the presence of proper resources and facilities but are also heavily influenced by students' knowledge and attitudes towards hygiene [1]. In a study conducted in Senegal, the reasons given for not washing hands included stubbornness [not wanting to follow what adults say], laziness, the rush to go to breaks, the time it takes away from playing, and the dirtiness and smell of the toilets [12].

According to a study done by Dreibelbis *et al.* 2014, unsafe drinking water, inadequate sanitation and substandard hygiene practices contributed to approximately 85% of diarrhea mortality [13].

This study investigated the general knowledge of primary school pupils on hygienic practices and the factors associated with the hygienic practices.

The purpose of the study was to generate information on the factors associated with hygienic practices among primary school pupils in Mwanza city. The study also investigated the knowledge of the school pupils with regards to hygienic practices. The results and recommendation of this study will be disseminated to relevant government institutions and other key beneficiaries for further action.

1.1. Variables

1.1.1. Independent/Explanatory Variables

Age, sex, awareness on hygienic practices, perception, location of school within municipality, and class of respondents.

1.1.2. Dependent/Outcome Variables

Hygienic practices including proper use of latrine and the practice of washing hands with soap and water after using the latrine.

1.2. Conceptual Frame Work

The conceptual framework illustrated below shows how the different factors can influence hygienic practices. The factors include, level knowledge and perception on hygiene, presence and accessibility of latrine, age and sex of individuals. Examples of hygienic practices include proper disposal of urine and feces into the latrine pit and the practice of washing hands with water and soap after visiting the latrine.

2. Method

2.1. Study Area

This study was done in Mwanza City which is located on the southern shores of Lake Victoria in Northwest Tanzania. Two administrative municipalities are found in Mwanza city namely Nyamagana and Ilemela. The municipalities are comprised of 12 wards in Nyamagana municipal and 9 wards in Ilemela municipal. In Mwanza city, there are 111 public primary schools with 60 schools found in Nyamagana municipality and 51 schools in Ilemela municipality. In average, 887 pupils may be enrolled /registered in one public primary school.

2.2. Study Design

This was analytical cross sectional study design that focused on the hygiene knowledge and general hygiene practice among pupils and associated factors at one point in time.

2.3. Study Population

The study population in this study was pupils from public primary schools with access to clean water in Mwanza city.

2.3.1. Sample Size Estimation

The sample size was estimated using Kish Leslie concept [38] as per formula below that covered the descriptive objectives.

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

Where:

n = minimum required sample size and z = for 95% confidence level, z= 1.96.

p = estimated prevalence for good hygienic practice was assumed to be 50% for getting the highest estimate of sample size.

e = maximum tolerable error at 5%. The estimated sample size was 384. When considering the sample size for analytical part of the study, the sample size was very small; hence we used the sample size calculated from Kish Leslie that covered all objectives. Taking into account the sampling procedure that was planned to be used, sample size was multiplied by design effect of 2 that resulted to minimum of 768 pupils. However, a total of 792 pupils accepted to participate in this study.

In this study, it was assumed that boys and girls could have different behavior and practices with regards to hygiene and hence the sample size was divided equally for both male and female pupils. A total of 396 boys and girls were respectively invited for this study.

2.3.2. Sampling Procedure and Data Collection

Based on the nature of the study, primary schools with water access were purposively considered for this study from both municipalities. A total of 11 primary schools had access to clean water, among which 7 primary schools were from

Nyamagana municipality and 4 primary schools from Ilemela municipality. All primary schools with access to water that were involved were public schools. A total number of pupils who selected to participate were obtained by proportional to size approach. Then systematic sampling technique was used to select pupils from each class. The class attendance registers were used as the sampling frame, where the names of the pupils were arranged in alphabetical order before selecting them. The sampling interval was obtained by dividing the total population in the class with the number of pupils to be studied in that class [N/n]. The starting point was randomly selected using pieces of paper [lottery method] that were given numbers and thereafter the interval was followed until the required number of pupils in each class obtained.

The structured questionnaires with closed and open ended questions were administered to selected pupils from each school and assisted to fill in by the researcher and assistants. This questionnaire was pretested at Luchebele primary school in Mwanza city. It was designed in English and translated to Swahili, then back translated to English to double check the inconsistency of Swahili version. The simple checklist was also used to capture some of the information from schools regarding the latrines cleanliness, number of pupils at school and number of latrine pits [pit holes] available.

2.4. Inclusion Criteria

All pupils of standard four to seven were eligible for this study. Those who voluntarily gave their informed consent and assent after head teacher and class teacher accepted on behalf of parents were included in the study. This group of pupils was selected because they should be exposed to hygienic knowledge as per Tanzania primary school curriculum.

2.5. Exclusion Criteria

All absentees during the data collection period [22nd July to 10th August, 2014] were excluded from this study because there was no plan for follow up and call backs.

2.6. Data Quality Control

- 1) All field data were documented on field data sheets/checklist and checked for completeness before leaving the respective class.
- 2) Research assistants were trained prior to work on ethics of data collection, objectives of the study, and general goals.
- 3) Questionnaire was pre-tested for validation before use on site.
- 4) The questionnaire was developed in English, and translated to Swahili language and then back-translated to Swahili by another person to ensure consistency on the contexts.

2.7. Data Management and Data Analysis

Collected data was entered into Microsoft Excel, then after doing data cleaning the file was exported to Stata version 11.0. The descriptive statistics that included mean/median,

bar chart and histogram were used to describe social demographic characteristics of the pupils. Chi square test was used to measure association between two variables and the significance of the association was judged based on 5%. Associated factors on hygienic practices were identified using logistic regression model. The odds ratio was used to measure association and it was reported together with its 95% Confidence Interval. To assess the awareness, six questions with “yes” or “no” answers were developed whereas “yes” was assigned 1 and no 0 hence the maximum score was 6. Scores [4-6] were considered aware while below 4 were considered unaware. Perception among participants was measured using the five points Likert scale ranging from strong disagree, disagree, neither agree nor disagree, agree and strong agree was used. The points were assigned numbers to represent marks one can score. Eleven questions were structured with a possible maximum score of 55. Scores between 0 – 32 were regarded to have a negative perception while scores above 33 considered to have a positive perception. Only those pupils who reported to do both proper use of latrine and hand washing with soap and water after using the latrine were considered to act hygienically.

2.8. Ethical Consideration

The proposal was submitted to CUHAS and BMC joint Research and Publication Committee for ethical clearance. The permission was obtained from the respective authorities at municipals and school level. In this study names of participants were not recorded during data collection for the sake of privacy and confidentiality. The goal of the study was well explained to all participants before asking them to voluntarily participating to the study. Teachers provided the informed consent on behalf of the parents to all pupils who decided to voluntarily join the study. Informed assent was obtained from all pupils before data collection procedure. Withdrawing from the study was clearly explained to all pupils.

2.9. Dissemination of the Results

Results obtained will be presented to the CUHAS – Bugando for partial fulfillment of the requirements for the Master of Public Health degree. In addition results shall be submitted to the Public Health officials at government, region and district levels and shall be used in health promotion initiatives.

3. Results

3.1. General Characteristics of Participants

The study included participants from 11 primary schools which had access to water in Mwanza city. There were 7 primary schools from Nyamagana municipality and 4 primary schools from Ilemela municipality. Only pupils from standard four to standard seven were sampled for this study. In Nyamagana municipality, the schools which were selected include Buhongwa, Ibanda, Nyegezi, Iseni B,

Mkuyuni, Nyanza and Nyakabungo while in Ilemelamunicipality; schools included Buzuruga, Nyamanoro, Mwenge and Ziwani. A total of 792 pupils were therefore participated in this study. It involved 50% male pupils and 50% were female pupils. In each school, the same number of pupils was invited and equal number of them was selected from each class hence 504 [63.6%] pupils from Nyamagana municipality and 288 [36.4%] pupils from Ilemela Municipality were invited to participate. The average age of the pupils participated in this study was 11.8 ± 1.4 . Majority of the pupils were aged between 10 years and 13 years with the median age of 12 years.

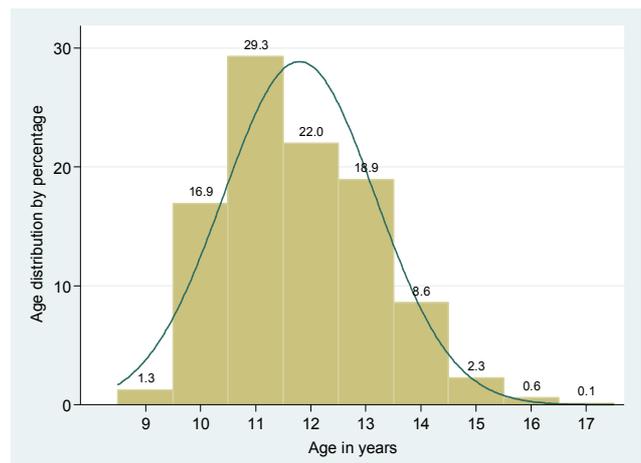


Figure 1. Age distribution of pupils by percentage.

3.2. General Awareness of Pupils on Hygienic Practices

In this study, pupils’ awareness on the importance of proper use of latrine and hand washing practices after latrine use were measured using six questions. Majority of the pupils, 771 [98.1%] said yes that they are aware on general hygienic practices, 788 pupils [98.3%] said yes they were aware that hand washing with water and soap is one of the hygienic practices, 763 pupils [96.3%] were aware that defecating into the pit of the latrine is an example of proper use of latrine, 739 [96.1%] were aware that hand washing with soap after latrine use is a way to prevent from diseases that can be transmitted by a fecal oral route while 680 pupils [85.9%] said yes that they were aware that defecating or urinating into bushes or at the sides of the latrine pit could result into transmission of sanitation related diseases and 642 pupils [81.0%] were aware that diarrhea is a disease that could be caused by poor hygiene and sanitation. Generally, majority, 773 pupils [97.6%] were aware on general hygienic practices, got a score of 4, 5 and 6 as per table 1 below.

Table 1. General awareness of 792 pupils in the Mwanza city.

Variable	Frequency [n]	Percent [%]
Knowledge		
Aware	773	97.6
Not aware	19	2.4

3.3. Perception of Pupils on Hygienic Practices

Eleven questions were developed to assess the perception of the pupils on different matters that in one way or another might affect their hygienic practices. In this study, scores ≤ 33 were regarded as negative perception while scores above 33 were considered to be positive perception. Regarding the accessibility of school latrine, majority, 460 pupils out of 792 [58.1%] strongly agree, 398 pupils [50.3%] strongly agree that the pit of the latrine is child friendly, majority 214 [27%] strongly disagree that all pupils use latrine properly, majority 318 [40%] strongly agree that the water source at school is easily accessible while 209 pupils [26.4%] also strongly agree that water availability is constant throughout. Majority 253 pupils [31.9%] strongly disagree that the schools had special hand washing facilities, 231 [29.2%] strongly disagree that the hand washing facility available at school is easily accessible, 218 [27.5%] strongly agree that pupils in standard one to three had low awareness on hygiene as compared to those in standard four to seven, majority 331 pupils [41.8%] strongly agree that hygienic education provided at school is sufficient, 488 pupils [61.6%] strongly agree that pupils should frequently be reminded on hygiene and 398 pupils [50.3%] strongly agree that poor hygiene practices among them is contributed by lack of facilities such as latrines and hand washing facilities. Generally, majority of the pupils 630 [79.6%] had a positive perception towards hygiene, scored above 33. Table 2 below summarizes the findings:

Table 2. Perception variables and responses.

Perception variable	Frequency [n]	Percent [%]
Accessibility of school latrine		
Strongly agree	460	58.1
Agree	204	25.8
Neither agree nor disagree	35	4.4
Disagree	52	6.6
Strong disagree	41	5.1
Usability of latrine pit		
Strongly agree	398	50.3
Agree	227	28.7
Neither agree nor disagree	27	3.4
Disagree	54	6.8
Strong disagree	86	10.8
Proper latrine use all pupils		
Strongly agree	172	21.7
Agree	135	17.1
Neither agree nor disagree	66	8.3
Disagree	205	25.9
Strong disagree	214	27.0
Accessibility of water source		
Strongly agree	318	40.2
Agree	240	30.3
Neither agree nor disagree	55	6.9
Disagree	125	15.8
Strong disagree	54	6.8
Availability of water at school		
Strongly agree	209	26.4
Agree	184	23.2
Neither agree nor disagree	84	10.6
Disagree	200	25.3
Strong disagree	115	14.5
Presence of special hand		

Perception variable	Frequency [n]	Percent [%]
washing facility		
Strongly agree	141	17.8
Agree	150	18.9
Neither agree nor disagree	32	4.0
Disagree	216	27.3
Strong disagree	253	32.0
Accessibility of hand washing facility		
Strongly agree	169	21.3
Agree	148	18.7
Neither agree nor disagree	51	6.4
Disagree	193	24.4
Strong disagree	231	29.2
Knowledge of standard 1-3 pupils		
Strongly agree	218	27.5
Agree	213	26.8
Neither agree nor disagree	113	14.3
Disagree	109	13.8
Strong disagree	139	17.6
Hygiene education		
Strongly agree	331	41.8
Agree	161	20.3
Neither agree nor disagree	33	4.2
Disagree	144	18.2
Strong disagree	123	15.5
Reminder on hygienic practices		
Strongly agree	488	61.6
Agree	216	27.3
Neither agree nor disagree	19	2.4
Disagree	41	5.2
Strong disagree	28	3.5
Poor hygiene due to lack of facilities		
Strongly agree	398	50.3
Agree	178	22.5
Neither agree nor disagree	43	5.4
Disagree	91	11.5
Strong disagree	82	10.3

3.4. Hygienic Practices Among Participants

Hygienic practices in this study was defined as the practice of washing hands with soap and water after latrine use and proper disposal of feces into the pit of the latrine. Three questions were structured to determine the hygienic practices among pupils. When asked where they go for defecation during school time, majority 763 pupils [96.4%] reported that they go inside the school latrine. Those who reported to use school latrines and homes latrines were considered to properly dispose of their feces; hence majority 773 pupils [98.2%] reported to make proper use of latrine. Majority 525 pupils [66.3%] reported to wash their hands after latrine use, however only 426 [53.8%] out of them wash their hands using water and soap. Tables 3 and 4 below summarize the findings:

Table 3. Distribution of perception and practice among 792 pupils.

Variable	Frequency [n]	Percent [%]
Perception		
Positive	630	79.6
Negative	162	20.4
Hygienic practice		
Yes	424	53.5
No	368	46.5

Table 4. Hygienic practices among pupils.

Variable	frequency [n]	Percent [%]
Where do you go for defecation		
Inside the pit of school latrine	763	96.4
At home latrine	14	1.8
Outside the school latrine	13	1.6
Into bushes	2	0.2
Do you wash your hands		
Yes	525	66.3
No	267	33.7
What do you use for hand washing		
Water only	99	12.5
Water and soap	426	53.8
Don't wash at all	267	33.7

3.5. Factors Associated with Hygienic Practices Among Pupils in the Study Area

Table 5 below summarizes how the different factors such as awareness, perception, age, and sex, location of school,

Table 5. Factors associated with hygienic practice.

Variable	Hygienic practices		Univariate		Multivariate logistic	
	Yes n [%]	No n [%]	Chi square	p-value	OR[95% CI]	p-value
Municipality						
Ilemela	174 [41.0]	114 [31.0]				
Nyamagana	250 [59.0]	254 [69.0]	8.6152	0.003	0.6[0.5-0.8]	< 0.001
Age in years						
≤12	281 [66.3]	269 [73.1]				
>12	143 [33.7]	99 [26.9]	4.3238	0.038	1.2[0.8- 1.7]	0.331
Class						
Standard 4	93 [21.9]	105 [28.5]				
Standard 5	100 [23.6]	98 [26.6]				
Standard 6	119 [28.1]	79 [21.5]				
Standard 7	112 [26.4]	86 [23.4]	8.3244	0.04	1.1[0.9 – 1.3]	0.154
Awareness						
Yes	410 [96.7]	14[3.3]				
No	363[98.6]	5 [1.4]	3.1771	0.075		
Perception						
Positive	349 [82.3]	281 [76.4]				
Negative	75 [17.7]	87 [23.6]	4.2904	0.038	1.5[1.1 -2.1]	0.023
Sex						
male	219 [51.9]	177 [48.1]				
female	205 [48.4]	191 [51.8]	0.9949	0.319		

3.6. Number of Pupils and Facilities Available at Schools

The number of pupils varied from one school to another. The schools which are located close to the municipality centre such as Nyanza and Nyakabungo had a few pupils as compared to other schools which are away from the city Centre. All schools studied had tap water as a source of water supply for the pupils. In most cases the tap was located at the center of the school yard. Majority of the studied school, 9 out of 11 [81.8%] had no hired workers for cleaning the latrines. All studied schools had no special hand washing facilities instead the tap for the main supply of water was also used as a hand washing facility. No school had soap present at the tap for hand washing. Appendix V has been attached for details.

and class of respondents are associated with hygienic practices among the participating pupils. On univariate analysis, location of schools within municipalities [p-value 0.003], age of the respondents [p-value 0.038], class of respondents [p-value 0.04] and perception [p-value 0.038] were the factors predicting hygienic practices. Across schools, majority, 254 [69%] out of 368 pupils with non-hygienic practices were from Nyamagana municipality, majority 269 [73%] with less than 12 years practice non hygienically, out of 368 pupils who were not aware on general hygiene, 363 pupils reported to practice hygienically and 349 out of 630 pupils [82%] of those with positive perception reported to practice hygienically.

On multivariate analysis, location of schools within municipalities was the only predictor that was significantly associated with hygienic practices among the pupils [odds ratio 0.6, 95% confidence interval 0.4 – 0.8, p-value < 0.001].

4. Discussion

4.1. General Hygienic Practice

In this study 424 [53.5%] out of 792 reported to do both hand washing with soap and water and make proper use of latrine while 426 [53.8%] out of 792 reported to wash their hands with soap and water after latrine use. This finding is higher than that of the finding of the study in Bogota, Colombia were 33.6% of the pupils reported to wash their hands with soap and water after latrine use [14]. However, contrary to this study, in which hygienic practice was defined as proper use of latrine and hand washing with soap and water after latrine use, the study in Colombia defined hygienic practice as the act of washing hands with clean water and soap

before eating and after toilet use [14]. Contrary to the finding of study in Angola, Ethiopia were only 15% [n =96] reported to wash their hands after defecation [1], majority of pupils in Mwanza city 525 [66.3%] reported to wash their hands after latrine use. This finding is more or less similar to the findings of the study in South Africa where majority 70% of students from urban schools reported to wash their hands before meal and after latrine use [15].

4.2. Sex and Age of Pupils on Hygienic Practices

This study assumed that male and female pupils could have had different hygienic practices. However, that is not the case; the findings revealed that there is no significant difference in hygienic practices between male and female pupils [p-value 0.319]. This finding is similar to finding of the study in Bogota, Colombia where sex was not statistically associated with hand washing behavior [14]. The finding in this study is also similar to a study in Vhembe, South Africa which indicated no significant association between hands washing after latrine use and sex [15].

In this study, it was revealed that the age of the pupils was not the significant factor associated to hygienic practices. There was no significant difference in hygienic practices between those below the age of twelve and those above twelve years [Odds ratio 1.2, 95% confidence interval 0.8 – 1.7, p-value 0.331]. This finding is similar to the finding of the study in Bogota Colombia where age and sex were not statistically associated with hand washing behavior [14].

4.3. Awareness of Pupils on Hygienic Practices

In this study, majority 773 pupils [97.6%] reported to be aware on general hygienic practices. However, the findings revealed that only 424 [54.9%] pupils out of 773 were practicing hygienically. It was also noted that there was no significant difference in hygienic practices between those who were aware and those who were not [p-value 0.075]. Although the reported percentage on awareness on the importance of hand washing with soap and water after using the latrine in this study is higher [n = 739, 96.1%] compared to that of the study in Angolela, Ethiopia where it was 76.7% [1], the findings of these studies are in agreement that awareness is not a significant factor of hygienic practice because only 57.6% which is 426 pupils out of 739 were washing their hands with water and soap in the study in Mwanza city while only 14.8% did wash their hands with soap and water in the study in Angolela, Ethiopia [1]. In this study, the fact that awareness is not a significant factor of hygienic practices is also supported by the observation that latrines in most studied schools were dirty at the time of data collection, urine and feces were splashed all over the slab and close to walls of the superstructure. It was also reported that some pupils were even defecating at the changing room [closet] which is meant to be used by adolescent girls especially during the menstruation cycle. This observation is similar to that of the study in Vhembe, South Africa [15]. The finding of this study is also similar to the finding of the

study in Chitungwiza, Zimbabwe in which it was found that children's knowledge and perceptions were inconsistent with hygiene [16].

4.4. Perception of Pupils on Hygienic Practices

Majority, 630 pupils out of 792 pupils [79.5%] in Mwanza city reported to have a positive perception with regards to hygienic practices. However, only 349 [55.4%] were reported to practice hygienic practice. However, this perception is low as compared to the finding in South Africa where the perception on hygiene was 91% [15]. In this study in Mwanza city, it was revealed that the perception of the respondent is a moderately significant predictor of hygienic practice [Odds ratio 1.5, 95% Confidence interval 1.1 – 2.1, p-value 0.023]. The difference in hygienic practice between those with positive was very minimal. This finding complements the finding of the study that was done in Zimbabwe in which both perception and knowledge of children were inconsistent with their hygienic behavior [16].

4.5. Location of Schools within Municipality and Hygienic Practices

In contrast to the study in South Africa, in which hygiene knowledge, attitude and practice were compared between the rural and urban schools [15], in this study all 11 primary schools were from the urban area. The finding suggests that there is significant association between location of schools and hygiene practices among the pupils, majority 254 [69%] out of 368 that reported to have no hygienic practice were from Nyamagana municipality [Odds ratio 0.6, 95% confidence interval 0.5 – 0.8, p-value < 0.001]. This finding is similar to the finding of the study in South Africa where majority 70% of students from urban schools were practicing hygienically as compared to those in rural schools [15].

4.6. Pit Holes for Male and Female Pupils

Through a checklist and personal observation, it was found that most schools had inadequate number of pit holes. Among the 11 schools that were studied, only Nyanza A primary school is close to meeting the standard set by the Ministry of Education and Vocational Training standard of 1 latrine pit per 25 boys and 1 latrine pit per 20 girls. At Nyanza A the ratio is 1 latrine pit for 27 boys and 1 latrine pit for every 24 girls. Apart from Nyanza in which each school is having different pits, in other schools the pits are shared between schools and two to three schools are found in the same compound with almost a similar number of pupils and therefore the ratio could be thrice as much for both sex and therefore the school does not meet the standard laid down by the ministry. On average, among the 11 schools studied, the ratio was 1:92 and 1:84 for boys and girls respectively but since the pits are shared by 2 or 3 schools, the ratio is one to more than one hundred boys and girls respectively. This observation finding is similar to the finding from the study that was done by UNICEF, SNV and Water Aid [10].

Contrary to the study in South Africa, where some of the schools in urban had flush latrines [15], in this study all schools had pit latrines.

4.7. Availability of Hand Washing Facilities with Soap

It was observed that, no school had a special hand washing facility inside or outside the latrine building. In all schools the water tap located at the centre of the school yard was used as a hand washing facility. Despite that majority of the pupils 426 out of 525 [81%] reported to wash their hands with soap and water, it was observed that no school had soap for hand washing that was put at the tap. During break times it was also observed large groups of pupils were going to the latrines together however majority were observed coming out of the latrine without passing through the tap to wash their hands. This is similar to finding in a study that was carried in South Africa where in all the schools, no soap was provided for hand washing [15]. In some schools a drum was put inside the latrine building and pupils were asked to use water from the drum for cleansing and hand washing after latrine use. Pupils are advised to come with individual one or two liters empty cans that they can use to fetch water either from the drum or directly from the tap. This finding is similar to the finding in a study that was conducted in South Africa in which most of the schools which had pit latrine, had only one tap located at the centre of the school and limits its accessibility to students which might probably have a negative impact on the status of the students' health because they normally visit the toilet in large numbers during break time hence making it unlikely for all coming from the latrine to wash their hands at the single water tap [15]. Probably the same reason could be used to explain as to why the pupils in this study were also observed coming from the latrine without passing through the tap to wash their hands.

Contrary to this study, a study that was done in Ghana found out most schools had special hand washing facilities apart from the tap. It was found that 42 schools out of 53 [79%] of the schools studied had different types of hand washing facilities and that only 17% of those lack soap at the hand washing facility [17].

4.8. Limitation of the Study

- 1) The definition of hygienic practice in this study was limited to only proper disposal of feces into the latrine pit and the act of hand washing with soap and water after latrine use.
- 2) The results on awareness and practice were based on what the pupils reported.

5. Conclusion and Recommendations

5.1. Conclusion

Majority of the pupils participated in this study reported to be aware on general hygiene. The majority also reported to have a positive perception on hygiene. However despite that, the study revealed that not all of them were practicing

hygienically. The latrines in most schools were dirty and pupils were observed not washing their hands when they came out of the latrine. Location of schools within municipalities and perception were the factors which were associated with the hygienic practices among pupils in primary schools in the study area.

5.2. Recommendations

The findings of this study call for different stakeholders including Mwanza City Council Authority, companies, NGOs, CBOs and the parents to take serious measures in the efforts of improving the observed challenges identified during the study for the wellbeing of the pupils' health. Based on the study findings the following recommendations are made:

- 1) The government should put emphasis on the existing hygienic education both theory and practice in the primary schools.
- 2) Hygiene promotion in terms of posters should be put on the walls of the latrine facilities to remind the pupils on the importance of behaving hygienically.
- 3) The government should ensure that school construction or expansion goes hand in hand with latrine construction to ensure that the ratio of pit hole to pupils meet the required standard set by the Ministry of Education and Vocational training.
- 4) The school committee should assist in making sure that water supplies are also connected to the latrine buildings.
- 5) As observed in some schools, other school should also adopt the systems of recruiting sanitation attendants.
- 6) Recommendation for further studies.
- 7) This study has successfully highlighted the knowledge, perception, and practice of the pupils on hygienic practices. However a further study is needed to investigate the other factors such as location and number of the facilities, policy related factors that could probably be the reasons for poor hygienic practices and sanitation among pupils in primary schools.

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