

## **Knowledge and attitude of hand washing among school children and education on hand washing technique. Rural East Rwanda**

Article by Marie Louise Umwangange  
Texila American University, Rwanda  
Email: lumwangange2008@yahoo.fr

### ***Abstract***

*Hand washing is a basic and simple practice which has a positive impact on community health; effective hand washing is an important measure to prevent the spread of microorganisms.*

*The objective of this study is to assess knowledge and attitude of hand washing among school children and to provide a health education session on effective hand washing technique.*

*It is a quantitative cross-sectional study. The study used a sample size of 180 children studying in grade 4, 5 and 6. A self-administered questionnaire was used to collect data, 170 questionnaires were well filled and a health education session was conducted on effective hand washing technique.*

*The results revealed 78.2% children who reported to always wash hands after using toilet, 88.8% children who reported to always wash hands before eating. 82.3% reported to use water and soap when washing hands and 87.1 % reported that they washed in palm, between fingers and in fingernails. The study showed that the reasons of not washing hands properly are forgetfulness (46.4%), lack of water (18.2%), lack of soap (17%), being in hurry (10.5%) and lack of water and soap (7.6%). The prevalence of diarrhea in three previous months was 13.5% . More than one third of the respondents do not know the importance of hand washing and more than one quarter do not know the consequences of not washing hands properly. The over-reporting of hand washing was different of what observed before health education when only 2 among 15 children randomly chosen washed between fingers.*

*There is a need of health education in order to improve the knowledge of children regarding hand washing and extending the health education sessions to other schools.*

**Key words:** knowledge, attitude, hand washing, school children, health education.

### **Introduction**

Hand washing is a basic and simple practice which has a strong effect in community health. The World health organization (WHO, 2015) stated that hand cleanliness is essential to protect people against infection. Hands are important vector in the transmission of infection from feces (WHO, 2015) as fecal-oral transmission diseases are mostly transmitted via hands. Hand washing showed to reduce diarrhea occurrence at 31 % in developing countries. (Ejemot, Ehiri, Meremikwu, Critchley, 2008). Effective hand washing had been documented as the most important measure to prevent the spread of microorganisms (Center for disease control and prevention (CDC), 2009; Nair, Hanumantappa, Gurushantswamy, Siraj, & Raghunath, 2014). As Stipulated by United Nations children's fund (UNICEF, 2011) poor hygiene and sanitation was linked to 80% of the country's disease burden in Rwanda, and diarrhea was the second cause of death amongst children. Hand washing with soap could reduce diarrheal deaths by 47% . Hand washing is a routine behavior that is taught to children, but little is done on the effective hand washing that shows the parts of the hand which need more emphasis during hand washing.

### **Problem statement**

Diarrhea kills about 2,195 children every day worldwide and can be prevented through safe water, improved hygiene and sanitation. Promotion of hand washing with soap is one of the proven ways of preventing diarrhea.(CDC., 2013)

A study conducted in India revealed that 86% of children always wash their hands before eating, but only 21.3% always used soap while washing their hands with 47.3% who never used the soap. (Ray, Amarchand, Srikanth, & Majumdar, 2011)

Only 33.6% of school children in Bogota are always or very often washing hands with soap and clean water before eating and after using the toilet(Lopez-quintero, Freeman, & Neumark, 2009), whereas only 14.8% of the students in Angolela (rural Ethiopia)washed hands after defecation the day before the interview (Vivas et al., 2011)

Moreover, Ray et al. (2011)reported that students' hands were contaminated before taking food by various pathogens such as Staphylococcus aureus, Escherichia coli among others due to washing hands without soap.

There are many studies assessing the practice of hand washing in health care facilities, but they are limited studies that are assessing the knowledge and attitude of hand washing in school children.

### **General objective**

This study will evaluate the knowledge and attitude of hand washing in school children and thereafter will be followed by education on hand washing technique.

### **Specific objectives**

This study will:

1. Evaluate the knowledge of school children about the importance of hand washing, and when to wash hands
2. Evaluate the knowledge of school children about the consequences of not washing hands
3. Estimate the way children wash their hands by reporting when, how and how often they wash their hands.
4. Evaluate the barriers of effective hand washing
5. Evaluate the correlation between knowledge of the role of hand washing, consequences of not washing hands properly and the occurrence of diarrhea in 3 previous months
6. Raise awareness of effective hand washing technique through health education session

### **Hypothesis**

The school children at Muyumbu primary school do not wash their hands effectively and their knowledge about hand washing needs to be improved through health education sessions.

### **Rationale of the study**

The purpose of this study is to assess the knowledge and attitude of hand washing among school children. This project was done to improve the health of the community through education on hand washing among the children. It will contribute to the prevention of diarrheal diseases in children and hence, enhancing the children's health.

## **II. Methodology**

### **Study area**

This study was done at Muyumbu primary School. Muyumbu primary school is a public school located at Muyumbu sector, Rwamagana District, Eastern Province.

## **Study design**

This is a quantitative cross sectional study.

## **Study population**

This study held at a primary school in Eastern province/Rwanda. The study population was 985 children studying in primary 4, 5 and 6.

## **Sample size and sampling methods**

A stratified systematic sampling was used where 10 children means number 4, 8, 12, 16, 20, 24, 28, 32, 36, 40 in each class was included in the sample. Primary 4 consist of 6 classes, primary 5 consist of 6 classes and primary six consist of 6 classes. Twenty children in each grade filled the questionnaire. The total of 180 children was included in the sample, 10 questionnaires were wrongly filled in and 170 children filled well the questionnaires.

## **Data collection**

Data were collected using a self- administered questionnaire. The questionnaire consisted of 9 short questions and can be filled in around 15 minutes. It was written in Kinyarwanda which is a vernacular language for Rwandans and the child filled in the questionnaire by her/himself. The questions to assess knowledge asked the crucial moments of washing hands, the advantages of hand washing and the consequences of not washing hands. The questions to assess attitude asked how often the child is washing hands according to the critical moments of hand washing and was graded from always to never. The questions asking the materials used by the child when she/he is washing hands (either soap and water or water only), and the question asking the area of the hand to focus on when washing hands were included in the questionnaire. The questionnaire was anonymous, the child only mentioned age, sex and class. Class teachers helped in distribution of questionnaires.

On day 1 : meeting the head teacher for “a go ahead” of the activity. On day 2: questionnaires were distributed helped by class-teachers.

## **Data analysis**

Data were entered in Microsoft Excel and presented in graphs after being analyzed.

## **Hand washing education**

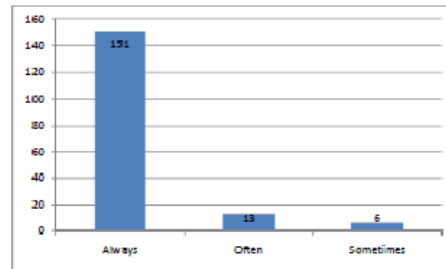
The topics which were included in health education are the importance of washing hands, the necessary moments of hand washing, the consequences of not washing hands properly, and lastly the practice of hand washing according to the steps of proper hand washing technique of World Health Organization which are: 0 wet hands with water, 1 apply enough soap to cover all hand surfaces, 2 rub hands palm to palm, 3 right palm over left dorsum with interlaced fingers and vice versa, 4 palm to palm with fingers interlaced, 5 backs of fingers to opposing palms with fingers interlocked, 6 rotational rubbing of left thumb clasped in right palm and vice versa, 7 rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa, 8 rinse hands with water then, 9 dry the hands with proper towel. Before the session fifteen children washed their hands under my observation, the I demonstrated the way of proper hand washing, then the same children did the counter demonstration. The papers highlighting the steps of hand washing with respective photos were distributed and hanged on each classroom for reference.

## **Limitations of the study**

This study assessed knowledge and attitude of hand washing of children studying at Muyumbu primary school in grade 4, 5, and 6. It cannot be generalized to the whole children of Rwanda, so further studies could be done in the future. The financial limitation makes the study to be limited to a sample size of 180 children.

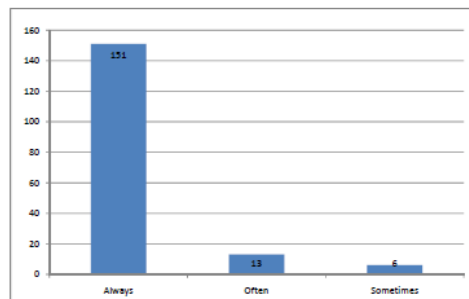
## Results

There were 170 participants; 83(48.8%)girls and 87 (51.1 %)boys. The mean age of participants was 13 years. 92 (51.1 %)children mentioned at least four moments a person should wash his/her hands, 39 (22.9%) mentioned three, 20 (11.7%)mentioned two and 19 (11.1 %)children mentioned one moment of hand washing.



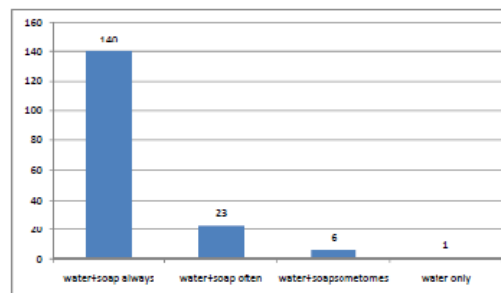
**Figure 1:** hand washing after using the toilet

**Figure 1** shows that 133 (78.2%)children responded that they always wash their hands before using the toilet, 31 (18.2%)responded that they often wash their hands after using the toilet and only 6 (3.5%)children responded that they sometimes wash their hands after using the toilet.



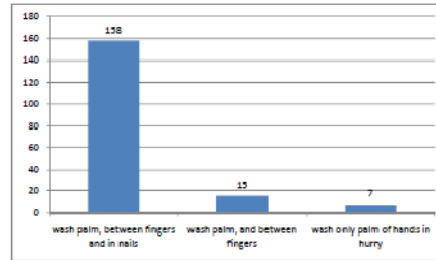
**Figure 2.** Hand washing before eating

**Figure 2** shows that 151 (88.8%)children responded that they always wash their hands before eating, 31 (7.6%)responded that they often wash their hands before eating and only 6 (3.5%) children responded that they sometimes wash their hands before eating.



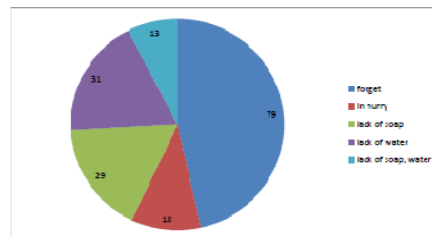
**Figure 3.** Use of water and soap when washing hands

**The figure 3** shows that 140 (82.3%)children reported that they always use water and soap when washing their hands, 23 (13.5%)often use water and soap, 6 (3.5%)sometimes use water and soap and 1 (0.5%)uses only water when washing his hand



**Figure 4.** How the respondents are washing the hands

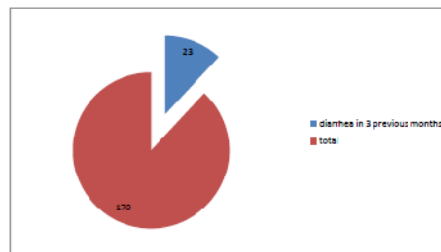
**In figure 4** 148 (87.1 %)children responded that they wash in palm, between fingers and in nails when they washing their hands, 15 (8.8%)children responded that they wash in palm of hands and between fingers, 7 (4.1 %)responded that they wash only in palm of hands in hurry.



**Figure 5.** Reasons of not washing hands properly

**The figure 5** shows that the reasons of not washing hands properly are forgetfulness (46.4%), lack of water (18.2%), lack of soap (17%), being in hurry (10.5%)and lack of water and soap (7.6%).

Among 79 children who forget to wash their hands, 33 of them (41.7%)are not reminded by anyone to wash their hands.



**Figure 6.** Occurrence of diarrhea in 3 previous months

**In this pie chart,** 23 (13.5%)children reported that they suffered from diarrhea in 3 previous months. Among 23 children who had diarrhea in 3 previous months, 12 of them responded that the lack of water and/or soap is the main reasons of not washing hands properly and 8 of them are in hurry when washing their hands and the remaining forget to wash their hands.

### **The role of hand washing and perceived severity of not washing hands**

48 children do not know the consequences of not washing their hands, and 12 (25%)of them suffered from diarrhea in 3 previous months, 6 (12.5%)of them wash their hands in palm and between fingers but not in fingernails and 5 (10.4%)of them only wash their palm in hurry.

Among 23 children who reported to suffer from diarrhea in 3 previous months, 12 of them (52.1 %)do not know the consequences of not washing their hands, 11 (47.9%)remaining know the consequences of not washing hands. 15 (68.1 %)do not know the role of hand washing and 8 (31.9%)know the role of washing hands.

Among 122 children who know the consequences of not washing the hands, 111 (90.9%) wash their hands properly (wash palm, between fingers and in fingernails), 8 (6.5%) wash in palm and between fingernails and 3 (2.4%) of them wash only the palm in hurry. 68 (40%) children do not know the role of washing hands, and 15 (22%) of them suffered diarrhea in 3 previous months, 8 (11.7%) of them wash their hands in palm and between fingers but not in fingernails and 6 (8.8%) of them only wash their palm in hurry.

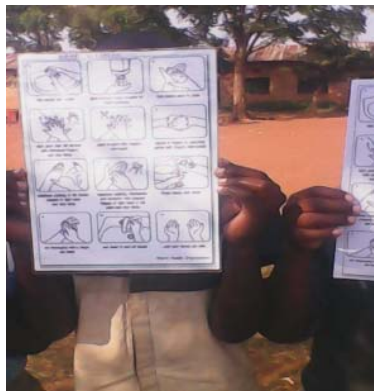
**Health education session photos**



**Photo 1.** Demonstration of the technique of hand washing



**Photo 2.** Return demonstration by a child studying in primary 5.



**Photo 3.** After health education and demonstration on how to wash hands, the papers highlighting the steps of proper hand washing were distributed.

## Discussion

During this study, the author found that forgetfulness was the main reason of not washing hands properly among the respondents (46.4%) and being in hurry was also another reason (10.5%) of not washing hands. This was also found in a study done in school children in Columbia which stated that forgetfulness, laziness and lack of time was the most commonly reason for not washing hands. (Lopez-quintero et al., 2009). The lack of soap and/or water was another reason of not washing hands (42.8%), this is also similar to what Xuan et al. (2013) stated that access to water and soap are important barriers to hand washing for school children.

88.8% children reported that they always wash hands before eating and 78.2% after using the toilet. Although 148 (87.1 %) children reported to wash their hands in palm, between fingers and in fingernails, among 15 children who randomly washed their hands under observation, only two of them washed between fingers. This was observed in several other studies that “washing hands before eating or after using the toilet, etc... are usually over-reported by respondents compared with the observed practice”. (Stanton et al. 1987; Curtis et al. 1993; Manum’ Ebo et al. 1997 as stated in Grimason et al., 2014).

The prevalence of diarrhea in three previous months among the respondents was 13.5% . More than one third of the respondents do not know the importance of hand washing as a preventative measure of diarrhea and 22% of them reported to have diarrhea in three previous months. More than one quarter do not know the consequences of not washing hands properly and 25% of them had diarrhea in 3 previous months. This showed a less understanding of knowledge of the role of hand washing in prevention of diarrhea as it was found in a qualitative study done by Mac Mahon, George, Yumkella and Diaz (2013) in Sierra Leone where the respondents rarely discussed the importance of hand washing with soap in preventing diarrhea.

## Conclusion

This study reported the knowledge and attitude of hand washing among school children in rural east Rwanda. More than three quarter of the respondents reported washing hands in palm, between fingers and in fingernails which is different to the observation made on 15 children randomly chosen to demonstrate how they wash hands when only two children washed between fingers. The knowledge of the role of hand washing and the consequences of not washing hands was associated with the occurrence of diarrhea in 3 previous months. Therefore, health education is necessary to increase knowledge and practice of hand washing among school children and observation is the better way of assessing children’s practice of hand washing. Health education sessions should be extended to other schools to increase the knowledge of the children in terms of hand washing.

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