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# FACTORS MOTIVATING HYGIENE HABITS IN WASH AMONG PRIMARY SCHOOL CHILDREN IN KASONGO MUNICIPALITY, DRC

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## ABSTRACT

This study explored factors that can motivate and/or impede hygiene habits in water, sanitation and hygiene (WASH) among primary school children. A cross sectional survey was carried out among 294 children and 4 head teachers in 4 selected schools. Data were collected using questionnaire and observation checklist regarding socio-demographic characteristics, knowledge and practice of respondents about hand washing practices among children from selected schools. Statistical analysis was done using SPSS version 22.0 after the data has been entered using Microsoft Excel. As results, out of these study findings, majority are boys with 164(55.8%) against 130 girls (44.2%). 114(38.8%) respondents were in 9-11 years of age, followed by those whore had 12 years and over. At last, 75(25.5%) children were in 6-8 years category. According to the religion, 92(31.3%) children were Protestants, followed by 86(29.3%) who were Catholics; whilst 79(26.9%) were Moslems. In view of the results, we noted that 211(71.80%) were educated about hand washing practice against 83(28.20%) who never been educated. According to the reason for washing hands with soap, 178(60.5%) children cited mainly to prevent diseases, and only 26(8.8%) children cited a personal hygiene. The study found that main source of information on importance of hand washing education was from teacher at school 154(52.4%). The knowledge of critical times for to wash hands concerned essentially; before and after eating 170(12.9%), before preparing food 85(28.9%), and after playing with friends 33(11.2%); while only 6(2.0%) children cited the visit of toilet. Most 140(47.6%) children in Kasongo primary school settings prefer wash the hands with water and liquid soap, followed by those 129(43.9%) who cited bar soap. 47(30%) children do not practice proper hand washing with soap, both in school and at home due to the unavailability and inaccessibility to hand washing facilities such as soap and water. This study has shown that education, knowledge of importance of washing hands with soap at each critical hand washing times, training on hygiene and sanitation, were factors motivated hygiene habits in WASH practices. Then, there is the need for effective for Information, Education and Communication to help promote hand washing knowledge and practices among primary school children.



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# INTRODUCTION

Impact of due to inadequate and unsafe water; lack of sanitation and poor hygiene behaviors is a complex issue (http://www.answers.com/topic/hygiene.sd). The occurrence and severity of hygiene related out breaks in endemic areas is greatly enhanced by human behavior with regards the practice of healthy hygiene (Majorin, 2014; UNICEF, 2013; WHO/UNICEF, 2018). Poor hygiene behaviour is a major problem in developing countries (Nath, 2009).

Hygiene and sanitation related diseases are a huge burden in developing countries; causing many people to fall ill even to die (Majorin, 2014). Schools have repeatedly been implicated in the spread of gastrointestinal disease, high among primary school going children (Nath, 2009; Nandrup-Bus, 2009). Improvements in hygiene behaviour are the most important barrier to many infectious diseases, because with safe behavior and appropriate facilities, people reduce their risk of becoming exposed to diseases (Majorin, 2014; UNICEF, 2023; WHO/UNICEF, 2018; Nath, 2009). A study conducted by Feachem stated that hygiene behavior influences the pattern of

diarrheal spread. Water handling, latrine utilization behavior received most attention (Scott, 2007). Among children for whom mainly positive hygiene behavior was recorded, the prevalence of diarrhea was 6.4 days per child-year, while it was 14.2 days per child year in children with mainly negative scores (WHO, 2004). As hands is an important mode of transmission of infectious disease among school-aged children. Simple hand washing with soap helps to protect children from the two common global pediatric killers (diarrhea and lower respiratory infection) (UNICEF, 2018; Curtis, 2009; Dube, 2012), hand hygiene significantly reduce illness-related absences in elementary school students by 26% (Water Aid, 2003). Critical times for hand washing include after using the toilet, after cleaning a child, and before handling food (Madeleen, 2000). The mere provision of water supply and sanitation facilities is not enough to bring down morbidity and mortality rates (Majorin, 2014). Water and sanitation facilities linked with hygiene behaviour have proven to be more effective in reducing diarrheal diseases (Nath, 2009; Khatoon, 2017) and support the improvements of sustained behavioral change (UNICEF, 2018; Khatoon, 2017; Kumie, 2005). Attitudes, Knowledge, and beliefs are some of the measures which are thought to be on the causal pathway to behavior. Poor knowledge and practice of, and attitudes to personal hygienehas negative consequences for a child's long term overall development (Madeleen, 2000). A study conducted in Ethiopia found that 60% of children surveyed did not know about the possible transmission of diseases through human waste (Oswald, 2008).

Awareness of health aspects of sanitation behavior is important because it determines the degree of sustainability of an intervention in sanitation. Perception strongly influences one's hand washing beliefs and practices. The hygiene behavior that children learn at school made possible through sanitation and hygiene-enabling facilities (Nandrup-Bus, 2009), and play a major role in ensuring good hand washing practices (UNICEF, 2018). A study conducted in Ghana indicates that lack of hygiene enabling facilities at schools and homes did not allow children's to practice the hand washing knowledge they had acquired (Dube, 2012). Hand washing facilities must be easily accessible and available at all times with the right materials necessary to make the process a success. A study conducted by Oswald and his colleagues revealed that lack of resources, namely soap and water, as well as inadequate sanitation facilities may be two of the main reasons why children do not wash their hands (Jason Cardosi, 2007). The location of hand washing led to some pupils forgetting to wash hands (Child, 2016). The family seemed to play a 50% of positive reinforcement compared to 27.3% who identified the school as a motivator (6). At school setting teachers act as role models; they also provide leadership in hygiene related issues within the school (Child, 2016). Based on the study conducted in sub-Saharan Africa, motivating factors behind proper hand washing included avoidance of dirt and smell of defecation, stay healthy, clean people are more accepted, cleanliness is associated with better socioeconomic status, hands feel and smell fresh, and avoid the risk of disease (Kishore, 2007). Also, if the children had clean hands, they would have clean books; resulting in better grades. Kasongo Zone Health Office report of last three years (2019, 2020, and 2021) showed that diarrhea and Upper respiratory Infections were among the top five diseases of the Health Zone. Literatures show that poor hygiene behavior remains high risk behavior increasingly responsible for high burden of these diseases. School children based research on hygiene behavior is required. The factors which may determine-motivate hygiene habits in WASH among school children are complex, interlinked and some of them are and remain difficult to measure. Previous studies conducted in Ethiopia, particularly in the study area, provide limited details about factors that determine behavior among school children. This study bridges the information gap on school hygiene behavior and to set evidence based intervention at school setting.

# METHODS

***Study design:*** A school based cross sectional study was conducted in Kasongo Municipality, DRC from December 2021 to May, 2022. All children enrolled in Kasongo primary schools were considered as source population.

***Sample size and sampling technique:*** The target participants for this study were school children in every selected primary school in Kasongo Municipality. Two hundred and ninety-four school children were estimated using a population proportion to participate on the study. They were selected randomly from the list of primary schools obtained from the Sub-division Education Office. Hand washing was particularly chosen and is important for children as they are more vulnerable to infections gained from unwashed hands and also due to their unhealthy behavior.

***Data collection:*** Structured questionnaire and observational checklist at school setting was used to collect data. The questionnaire was initially drafted in English, translated to French, and then back to English. Four teachers as data collection facilitators at school settings and two health extension workers as data collectors were recruited to facilitate and guide the data collection process. The study staff was given training for three days by the principal investigator on the objectives of the study, techniques of assisting study participants whenever they come across difficulties in completing the questionnaire, in order to avoid incompleteness of the questionnaire. Then, the data collection tools were pre-tested on 32 school children in similar school in the study area which was not included in the study. The pre-test had conducted prior to the actual data collection time to assess the suitability of the questionnaire with regards to duration, language appropriateness, content, validity, and question comprehensibility. Some amendments were made after the pretest activity. WHO indicated that water handling, latrine utilization, and hand-washing practice are three key hygiene behaviour (Van Wijk C, 2003). The questionnaire had consisted of; socio-demographic information's (age, gender, religion), and the aspects concerning the hand washing education, hand washing knowledge and practices, and hand washing facilities, to be supposed factors motivating the hygiene habits in WASH practice.

***Data analysis:*** After the data were entered in Microsoft Excel and performed in SPSS version 22.0, descriptive analysis was done by calculating frequencies. Statistical significance was defined as Pearson's chi-square, P-value ($\leq 0.05$), and Odds Ratioas the used tests. Statistically significant factors form bivariate analysis and were included to identify the independent predictors that affect the participant's hand washing education, hand washing facilities, and hand washing knowledge and practice.

***Ethical Consideration:*** Ethical approval for the study was given by the Provincial Health Ethical Review Committee in Maniema, DRC. Permission to conduct this study research was obtained from the Sub-division Education Office. Informed verbal consent was obtained from each parent of each children, where we stating clearly the objectives of the study. Strict confidentiality was maintained in data handling.

# STUDY FINDINGS

The results of this table show that out of 294 respondents, 164 (55.8%) are boys and 130 (44.2%) are girls.Of this 164, 152 (51.7%) know the importance of handwashing from school against 121 girls (41.2%).The tests show a significant association between gender and knowledge of the importance of handwashing from IEC at school given that p-value=0.016<0.05 and OR=22.Thus, there is 22 times the chance of knowing the importance of washing from IEC at school according to gender. Table 4-9 above shows that there is not a strong association between student age and knowledge of the importance of handwashing, given that p-value = 0.1, it-even p>0.05. Indeed, age influences knowledge about the importance ofhandwashing at school 5 times, given that the OR is greater than 2. In view of these results, we note that there is a statistically significant relationship between age and the reasons for washing hands.(p=0.00 and OR=10.4). In other words, the older we get, we have 10 times the chance of

knowing the reasons for washing our hands. In view of the results above, we find that there is no statistically insignificant relationship between age and hand washing practices.(p=0.518 and OR=1.317). In other words, age does not influence handwashing practices among students.

***Improvement as per reviewer comments:*** This chapter discusses the study findings which are reported in the previous chapter. Literature is used to compare this study results to those conducted by previous authors. The current study looked at the availability of hand washing facilities, hand washing knowledge, and practices at the critical times among 294 selected from school children in Kasongo Municipality in DRC. The mean age of the current study was 9.0 years. Majority (55.8%) of the children were boys and most (38.8%) of the children were within the age of 9 – 11 years. With respect to religion, majority (31.3%) of the children were Protestants, 29.3% were Catholics, whilst 26.9% were Moslems. This result shows that out of 114 respondents 88(29.9%) whose age is between 9-11 years old, knowing the existence of water points within the school establishment against 26(8.8%) who don't know. Out of 105 respondents aged 12 and over, 63(21.4%) know of the existence of water points within the establishment against 42(14.3%) who do not know. these results give a significant relationship between the age and the knowledge of the pupils on the existence of the water points within the school ($p$= .02, and OR=7.5). These findings show that out of 114 participants in the survey, 77(26.2%) whose age is between 9 and 11 recognize that the school is supplied against 37(12.6%) who do not know.Of the 105 subjects whose age is 12 years and over, 66(22.40%) know against 39(19.30%) who do not know.Thus, the result shows a relationship between age and knowledge of water supply in the school, in other words, the older the age, the more knowledge about the water supply in the school improved ($p$=0.01 and OR 8.5). The analysis of the results given in this study indicates that out of 114 pupils aged 9-11 years, 65 subjects (22.10%) cited the standpipe as a source of water supply against 25(8.5%) whocited the school well, 23(7.8%) cited the public well. Among the pupils aged 12 and over, 48(16.3%) cited the public well as their source of water supply, 34(11.60%) cited the public tap against 23(7.8%) whocited the school faucet as a source.mentioned the public tap as a source of water supply within the school. The analysis of statistical tests did not show a very significant relationship between age groups and knowledge of sources of supply (p= 0.2; OR=8). The study results show that of the 164 male respondents, 96(32.7%) said that handwashing points were further away from classrooms and toilets compared to 68(23.1%) whoanswered that the hands washes are integrated in the toilets. For girls, for an effective of 130, 77(44.2%) agree that the washing points are more distant against 53(18.0%) who believe that some washing points are in the latrines. The statistical analyzes carried out did not show a very significant relationship between gender and the benchmark for handwashing points (p=0.00; OR=0.09).

The results of this study show that out of 164 male subjects, 119(40.5%) recognized the existence of soap or ash in the hand washing point against 45(15.3%) who affirmed theopposite.Out of 130 female students, 93(31.6%) acknowledged the availability of soap at the handwashing point against 37(12.6%) who said the opposite.Statistically, the relationship is not statistically significant between the sex of the students and the existence of soap or ash in the handwashing point (p=.004 and OR=.038). We note in this result that out of 164 male students, 138(46.9%) recognized the availability of basins and handwashing points against 26(8.8%) who said the opposite.Out of 130 female students, 93(31.6%) recognized the existence of basins in the handwashing points against 37(12.6%) who gave the opposite point of view.The relationship is statistically significant (p=.013 and OR=6.812). Analysis of the study results shows that out of 164 male students, 97(33.0%) recognized the existence of a common hand washing points against 67(22.8%) who said opposite. Of 130 female students, 69 (23.5%) recognized the existence of a washing block against 61(20.7%). This relationship between gender and the existence of handwashing points is statistically significant (p=0.37; OR=3.880). Eseoghene *et al*. assert that adequate availability and usage of hand washing facilities can effectively influence hand washing among school children thereby improving school performance (Eseoghene *et al.,* 2013). The study findings can be compared to similar findings of the project evaluations and research conducted in Bangladesh which found out a 15% increase in attendance when safe water was available within 15 minutes (Redhouse, 2004) as quoted in (IRC, 2007). Mohammed (2016) described that most school children in Ghana do not practice proper hand washing with soap, both in school and at home, due to the unavailability and inaccessibility of hand washing facilities such as soap, towel, and clean running water (Mohammed, 2016). These study findings are similar to study that was conducted by Oswald (2008) who argued that lack of resources, namely soap and water, as well as inadequate sanitation facilities may be two of the main reasons why children do not wahs their hands. In Ghana, Steiner-Asiedu *et al*. as well as Monney *et al*. have attempted to describe the available handwashing facilities in a sample of schools (Steiner-Asiedu, 2011). Our findings corroborated with the results of Oswald et who argued that lack of resources, namely soap and water, as well as inadequate sanitation facilities may be two of the main reasons why children do not wash their hands (Oswald *et al*., 2008).

Overall in rural Ethiopia, only 8% have access to adequate sanitation facilities (WHO, 2009). In the rural Amhara region of the country, only 21% of latrines had hand washing facilities, none of which contained soap, and less than 4% of households had access to adequate sanitation facilities (O'Loughlin, 2006). Our observation further revealed that schools having hand washing point without soap can be a major barrier to proper hand washing in schools as hand washing without soap is inadequate hand washing. The second objective of the study was to establish the association between IEC interventions in WASH and the level of knowledge in wash practices among primary school children. In view of these findings, we note that out of 49 students in the first year, 30 students (61.2%) were informed about hand washing against 19(38.8%) who did not receive the information. Out of 49 second year pupils, 47(95.9%) were informed against 2 (4.08%) who were not informed. For the 5$^{th}$ year class, all of the pupils 49 (100%) werebeen informed about hand washing. There is a statistically significant relationship between class of students and information about hand washing ($p$=0.00 and OR= 12.5). The study findings show that out of 294 respondents, 164(55.8%) are boys and 130 (44.2%) are girls.Of this 164, 152(51.7%) know the importance of handwashing from school against 121 girls (41.2%). The tests show a significant association between gender and knowledge of the importance of handwashing from IEC at school given that $p$-value=0.016<0.05 and OR=22. Thus, there is 22 times the chance of knowing the importance of washing from IEC at school according to gender. The findings show that there is not a strong association between student age and knowledge of the importance of handwashing, given that $p$-value = 0.1, it-even $p$>0.05. Indeed, age influences knowledge about the importance of handwashing at school 5 times, given that the OR is greater than 2. In view of the study findings, we note that there is a statistically significant relationship between age and the reasons for washing hands ($p$=0.00 and OR=10.4). In other words, the older we get, we have 10 times the chance of knowing the reasons for washing our hands. The findings of our study show that there was association between respondents' gender and knowledge on hand washing. This means that gender can have an influence on washing hands correctly and hand washing behavior, majority of the boys knew the importance of hand washing than girls. It can mean that boys are therefore more likely to wash their hands correctly than girls. This is almost contrary to a study by Mariwah *et al* which asserts that higher proportion of female students than male students washed their hands and were more likely to wash both hands correctly (Mariwah *et al*., 2012). The study findings corroborated with that Behailu*et al* (2016) confirmed, by accepting that proper hand washing is one of the simplest, most affordable and effective means of stopping the spread of infection via feces, body fluids, and inanimate objects. The findings of the present study correspond with a study conducted by Ryan (2001) argued that hand washing has been shown to be effective and also cost-effective means of preventing communicable diseases (Ryan, 2001). Most school children are aware

| | | | Is it important to wash hands with soap when in school? | | Total | $X^2$ | P | df | OR |
|---|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | | | | | |
| Gender | Boys | Frequency | 152 | 12 | 164 | 10.390[a] | 0.016 | 3 | 22 |
| | | % | 51.7% | 4.1% | 55.8% | | | | |
| | Girls | Frequency | 121 | 9 | 130 | | | | |
| | | % | 41.2% | 3.1% | 44.2% | | | | |
| Total | | Frequency | 273 | 21 | 294 | | | | |
| | | % | 92.9% | 7.1% | 100.0% | | | | |
| REALISATION | | | Is it important to wash hands with soap when in school? | | Total | $X^2$ | df | P-Value | OR |
| | | | Yes | No | | | | | |
| Age of pupil (years) | 6 – 8 | Frequency | 68 | 7 | 75 | 4.530[a] | **2** | 0.1 | 5.185 |
| | | % | 23.1% | 2.4% | 25.5% | | | | |
| | 9 - 11 | Frequency | 103 | 11 | 114 | | | | |
| | | % | 35.0% | 3.7% | 38.8% | | | | |
| | 12 and over | Frequency | 102 | 3 | 105 | | | | |
| | | % | 34.7% | 1.0% | 35.7% | | | | |
| Total | | Frequency | 273 | 21 | 294 | | | | |
| | | % | 92.9% | 7.1% | 100.0% | | | | |

| | | | Why is it important to wash your hands? | | | | *Total* | $X^2$ | *df* | *P-VALUE* | *OR* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *To preventdiseases* | *To removegerms* | *To removedirt* | *Personalhygiene* | | | | | |
| Age of pupil (years) | 6 - 8 | Frequ. | 46 | 10 | 8 | 11 | 75 | 90.819[a] | 6 | .000 | 10.4 |
| | | % | 15.6% | 3.4% | 2.7% | 3.7% | 25.5% | | | | |
| | 9 - 11 | Frequ. | 39 | 12 | 48 | 15 | 114 | | | | |
| | | % | 13.3% | 4.1% | 16.3% | 5.1% | 38.8% | | | | |
| | 12 and over | Frequ. | 93 | 10 | 2 | 0 | 105 | | | | |
| | | % | 31.6% | 3.4% | .7% | 0.0% | 35.7% | | | | |
| Total | | Frequ. | 178 | 32 | 58 | 26 | 294 | | | | |
| | | % | 60.5% | 10.9% | 19.7% | 8.8% | 100.0% | | | | |

| | | | Demonstrate how you wash your hands? | | *Total* | $X^2$ | df | P | OR |
|---|---|---|---|---|---|---|---|---|---|
| | | | *Washcorrectly* | *Wash wrongly* | | | | | |
| Age of pupil (years) | 6 - 8 | Frequ. | 50 | 25 | 75 | 1,317[a] | 2 | .518 | 1.317 |
| | | % | 66.6% | 24.4% | 25.5% | | | | |
| | 9 - 11 | Frequ | 80 | 34 | 114 | | | | |
| | | % | 70.1 % | 29.9% | 38.8% | | | | |
| | 12 and over | Frequ | 66 | 39 | 105 | | | | |
| | | % | 62.8% | 38.2% | 35.7% | | | | |
| Total | | Frequ | 196 | 98 | 294 | | | | |
| | | **%** | **66.7%** | **33.3%** | **100.0%** | | | | |

and accepted the fact that it is important to wash hands with water and soap when in school. This universal acceptance of the importance of hand washing by the school children can influence their hand washing practices both in school and at home positively. This agrees with a study by Chittleborough *et al* which found out that knowledge of the importance of washing hands to reduce the spread of germs was high among pupils (Chittleborough *et al*., 2012). Behailu *et al* concluded most school children are aware of the essence of hand washing, having sufficient knowledge about hand washing but poor in practice, then there is the need of hand washing education for those children (Behailu *et al.,* (2016). This study also revealed that only small proportion of study participants practiced proper hand washing behavior; availability and accessibility to facilities (water and soap), and pressure from important referents were significantly associated with hand washing practice. In view of the findings, we found that there was no statistically significant relationship between age and hand washing practices (*p*=0.518 and OR=1.317). In other words, age does not influence hand washing practices among school children. However, we found that there is a statistically significant relationship between age and the way of washing hands (p=.000; OR=58.871). In other words, age influences how students wash their hands. Analysis of these results shows that there is a statistically significant relationship between age and time to wash hands (p= 0.00; OR= 88.883). In other words, the older you get, the more you know when to wash your hands. Analysis of these results shows that there is a statistically significant relationship between age and time to wash hands (*p*= 0.00; OR= 88.883). In other words, the older you get, the more you know when to wash your hands.

Analysis of these results shows that there is a statistically significant relationship between age and the best types of soap for washing hands (p=0.008; OR=12.2). In other words, the older you get, the more you know the best types of handwashing soap. The analysis of these results shows that there is a statistically significant relationship between age and the way of washing hands. (p=0.00; OR=11.82) In other words, the older the students, the more they choose the best way to wash their hands. The analysis of these results shows that there is a statistically significant relationship between the class of the pupil and the washing of hands with ash (p=.000 OR=22.109). Thus, the more the student goes up in class, the more he masters the substitutes for soap for washing hands. The analysis of these results shows that there is no statistically significant association between the gender of the students and the use of green leaves instead of water for hand washing (p=.0.230 OR= 1.175). The analysis of these results show that there is a statistically significant relationship between the students' religion and hand washing (p=.000; OR=53.427). The analysis of these results shows that there is a statistically significant relationship between the students' religion and critical hand washing times (*p*= .001; OR = 29.2). The analysis of these results shows that there is a statistically significant relationship between the age of the pupils and the critical times of hand washing (*p*= .000; OR=56.6). The analysis of these results shows that there is a statistically significant relationship between the class of the pupil and the washing of hands before and after the meal (p= 0.00; OR = 96.839). The analysis of these results show that there is a statistically significant relationship between the student's age and hand washing at critical times, then after handling waste (p= 0.00; OR= 28.375).

In Ethiopia, Vivas *et al*., (2010) argued that, studies from the Philippines and Colombia indicated that 75.9% and 46.9% of students, respectively, reported washing hands before meals. The considerably higher frequency of hand washing before meals among Ethiopian children may be due, in part, to the Ethiopian cultural tradition and ceremonial practice of washing hands before meals, or the desire for clean, fresh hands before eating (Scott *et al*., 2007). However, only 36.2% of students who washed their hands reported using soap. This is similar to the Philippines and Turkey studies where an average of 37.7% and 42.4% of children, respectively, washed their hands with soap (Yalcin, 2009).

In contrast, in this our current study, (2.0%) of school children knew to wash their hands after using the toilet. These findings are in similar with a study conducted in the Philippines which found that 35% of students reported poor bathing (Department Health, Philippines, 2009). The study also sought to determine the association between IEC interventions in WASH and school performance among primary school children after being educated. The analysis of these results showed that there is a statistically significant relationship between the school children's age and the hand washing acquired habits after being trained through Information, Education, and Communication (IEC) interventions (p= .000; OR=58.871). The findings of this study also indicate a significant association between respondents' gender and the correct habits of washing hands when at school (p=.029; OR= 7.12). This agrees with a study by Chittleborough *et al*. which found out that knowledge of the importance of washing hands to reduce the spread of germs was high among pupils who were trained on hand washing practices. Therefore, a significant number (53.1%) of the children in the present study wash their hands by following only two steps: to wet and to rinse despite the training that obliged to follow the five steps (to wet hands, to apply soap, to rub, to rinse, and to dry the washed hands). That poor knowledge about the use of the five steps of hand washing practice may be due to lack of hand washing education in the schools as most of the children have never been educated on hand washing. Therefore, there is a gap between knowledge and practice which needs to be addressed; there is the need for effective hand washing education in the schools.

These study findings can be compared to similar findings of Behailu *et al*. (2015) who found out that proper hand washing also improves learning and teaching processes by reducing absenteeism. Hand washing reduces absenteeism as evidenced by study conducted around the world like 54% (China), 40% (Egypt), 35% (Kenya), 27% (Philippines) and 20% in (Colombia) (Behailu *et al.,* 2015). The analysis of the pretest results (results are observed before the intervention) showed the smallest number of children performing at an advanced level (e.g. of knowledge of reason of washing hands had increased in pre-test from 37.8% (n=111) to 60.5% (n=178) in post-test; the knowledge of critical hand washing times, in pre-test, 31.3% (n=92) to 40.1% (n=118) in post-test; to wash hands correctly, in pre-test 25.2 % (n=74) to 66.7% (n=196) in post-test. Most children who completed the tests performed to basic and satisfactory levels. Accordingly, the post-test levels were satisfactory. The differences between the pretest and posttest results indicate that the number of children performing at a satisfactory level increased.

An analysis of the results of the posttest showed that, across the six possible tasks, both male and female from six-year-old children achieved satisfactory results which are observed during the two periods: pre- test (basic results) and post-test (advanced results). The differences between the pre-test and post-test advanced levels were found to be increased. These findings are similar to the study conducted by Dongre *et al*. (2018) who argued that a KAP survey in India demonstrated improvement in school children's personal hygiene after receiving health education program (Dongre, *et al*. 2018). In the contrary, a study conducted in Ghana indicated that school children despite being informed about the significance of hand washing, were not able to practice due to lack of hygiene enabling facilities at the schools (Aiello, *et al*., 2008).

# CONCLUSION

The discussions on the findings of this study led to the conclusion that availability of wash facilities, level of knowledge, practice of hand washing at critical times, and the school performance positively influence the hand washing practices among primary children in primary school settings. It is against this backdrop that this study examines the availability of hand washing facilities, hand washing knowledge, and practices at each critical times among school children in Kasongo primary school settings. The findings we report in this study indicate that hand hygiene facilities are still not universal in all primary schools in the Kasongo Municipality, with only 18.4% of surveyed schools in Quarter Kauta 13.3% in Quarter Kilometeter18, 13.3% in Quarter Limanga and 23.5% in Quarter Tchatchatcha with a handwashing facility. The danger of this may be catastrophic should an outbreak occur in the municipality. This calls for the Government of DRC to step up his efforts in training primary school on the importance of having and utilizing handwashing facilities. The hand washing knowledge of the school children was found to be inadequate although they universally accepted the importance of hand washing in preventing diseases. There was minimal hand washing practice with soap before and after eating, but poor after visiting toilet, after handling garbage and when hands are visibly dirty. Hand washing facilities were also found to be inadequate as most of the schools lacked clean running water, soap and other important components of hand washing practice. So, there is the need for effective hand washing education in the schools. This will help address the knowledge gap and change hand washing behavior of the school children, and then to improve not only their performance at school, but also their health. DRC Education service should also consider including hand washing education in the school curriculum that can be reinforce the habitual hygiene course that is irregularly taught once by week. This innovation will use teachers as agents in delivering the knowledge to the school children. Hand washing facilities should be made available in all the schools to enable the school children translate knowledge into practice. This can also be done by using local economic options like tippy taps. We conclude that it is essential to have a financial provision for water supply in schools as this can potentially influence the existence of a handwashing station in a school. An intervention by government, educational authorities and civil society organizations towards enabling schools in low resource areas to have a sustainable budgetary allocation for WASH facilities would be timely.

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