

## **The Prevalence of Diarrheal Diseases in Childcare Institutions, Uasin Gishu County, Kenya**

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**Abstract:** *Diarrheal disease is one of the leading middle income countries. This study examined diarrheal diseases among children in Uasin Gishu County's childcare institutions per age, sex, duration of a child in a childcare institution, and use of soap in hand washing after visiting the toilet. The study involved 202 children between ages 6 to 20 years old. There were 65.8% boy child and 34.2 girls, 71.3% of these children were between 6-15 years old. The study found 64.4% children used soap to wash hands after toilet. Use of soap in hand washing increased with increase in children's age, with a girl using soap more in hand washing at the rate of 84.1% compared to a boy child. The study learned that 90.1% children had suffered from diarrheal diseases within 28 days where 61.4% boys had suffered from diarrhea. Chi-square analysis showed a significant relationship between diarrheal diseases and children's age ( $P < 0.001$ ) while there was a significant relationship between diarrhea and gender ( $P < 0.001$ ). It was concluded that the prevalence of diarrheal diseases in Uasin Gishu County child care institutions was 90.1% and that boys were affected more than the girls. Health education on use of soap in hand-washing after toilet should be intensified as a means of decreasing diarrheal diseases.*

**Keywords:** *Childcare institutions, Environmental conditions, Diarrheal Diseases, water and Sanitation, Hygiene, Uasin Gishu County*

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### **1. INTRODUCTION**

Diarrheal disease is one of the leading causes of death among children who are younger than five years old from low and middle income countries. It is a documented fact that diarrheal diseases forms major public health problem in children under 5 years of age, especially in developing countries (Mattoo, 2008). Little is known about the causes of deaths in children after five years old (Suraweera et al., 2011). A study by Sameul (2012) found that children in developing countries suffered from an infectious form of diarrheal diseases which resulted from environmental causes such like poor sanitation, none use of soap in hand washing, lack of safe water, nutrition and a poor understanding of diarrheal diseases' transmission methods. Children in childcare institutions lacked close parental guidance and they were easily prone to environmental infectious diseases' transmission because not properly guided on personal hygiene especially hand washing. Article 20 of Convention on the Rights of the Child (United Nations General Assembly, 1989) lists a number of options for childcare, orphanages, foster homes, adaption or family volunteers where children are given care, education, and protection. George Muller, a Prussian evangelist, saw children everywhere in Bristol, England who lived on the streets or in state-run poorhouses, where they were treated badly (Roger, 2005). He started a girls first orphanage (the Ashley Down's Orphanage) in 1834. The Orphanage was restricted to children who were born in wedlock, but whose both parents were dead (Roger, 2005). These institutions were made for destitute children only, children who were lacking (food, clothing and shelter). Diarrheal disease remains the leading killer disease in Southern Asia and Sub-Saharan African countries, and accounted for 9% of all under-fives in 2015 (UNICEF, 2015). According to Hung, diarrhea is defined as a change in bowel habit for individual child resulting into substantially more frequent and/or looser stools (Hung, 2006). It is a condition where one passes stool more than two-three times a day.

There are three types of diarrheal diseases: acute watery diarrhea, which could easily result into a varying degree of dehydration; persistent diarrhea, which lasts for 14 days or longer and manifests by

mal-absorption, nutrient losses, and wasting of the affected; or bloody diarrhea, a condition which has signs of intestinal damages from inflammation of the intestines (Keusch et al., 2006). A study in Ghana, by (Woldemicael, 2003), showed that the risk of having diarrhea diseases is associated with children's age, quality and quantity of water available, household's economic status, place of residence, general level of hygiene, and availability of toilet facilities. He also found that children who lived in in-house built toilets were 50% less likely to contract diarrheal diseases than those who used outside toilets. Availability of adequate quantity of water is associated with improved hygiene that may lead to reduction of fecal oral contamination, and a clean home environment (Esrey et al., 1985). A study by Oriet, et al., (2014) stated that children who used public latrines were to be accompanied by an adult because they could be tempted to pick used tissues from dirty floors to use after defecation. They should also be encouraged to wash hands after toilet to maintain safe hygiene as a means of reducing diarrheal diseases which is estimated to cause deaths of about 150,000 children yearly in Nigeria. Aung and The in (1989), found that hand washing was a great means of reducing diarrheal deaths in children by 50 percent. When mothers and children were provided with soap and encouraged to wash hands before preparing meals and after defecating in Burma the results showed a reduction of 30 percent diarrheal infections (Aung and The in, 1989). A bacteriology study by Pietrangelo (2015), found that most diarrheal diseases were caused by virals, bacteria, parasites and malnutrition due to poor hygienic conditions. Girls have been found to be having a higher diarrheal mortality rates than boys whose diarrheal morbidity is found to be higher than that of girls (Critchley et al., 2009). Davies (2015), studies on 100,000 people who visited toilets found staggering 62 per cent men didn't wash hands after toilet, compared to 40% female.). A study by CDC (2010) on a guide to hand washing indicated that 5% of people washed their hands effectively enough to destroy infectious germs after using toilet. The study showed that, 10% of the 3,749 people observed in public restrooms skipped washing their hands completely. 33% did not use soap when washing. Men were more likely to skip hand washing after using the toilet than women. A study in India among children aged between 5-14 years found 12% of all diarrheal deaths were boys compared to 17.3% girls at 99% CI, (Morris, 2011). A study carried out on 69,309 children from middle class community, on hand washing with soap after toilet found 30% children had an infection of diarrheal disease, (Nwadiaro et al., 2015). Small children have a habit which facilitates dissemination of diarrheal diseases, such like putting fingers and objects into their mouth, because of not having a close interpersonal care by an adult, (Goldbaum, 2007). Children in childcare institutions come from various environmental and social backgrounds with most of them coming from the streets where they stay in poor environmental conditions with diarrheal diseases being the order of the day. Children in childcare institutions get diarrheal infections more often compared to home parentally cared children of the same age. A study by (Gelaye et al., 2010), on knowledge, attitude and practices of school going children in Ethiopia found mothers were the family's primary caretakers and had the responsibility of teaching children the proper health care and good hygienic practices. Children who were cared in childcare institutions had no close guardians who could provide them with communicable diseases' transmissions knowledge. Young children come into contact with many other children as they play and they get subjected to high chances of contracting infections while sharing toys, touching each other as they play and because of not having enough knowledge on how to use toilets and latrines they get infections easily (Hung, 2006). These children do have diarrheal diseases, even if they wash hands after toilet like their counterparts who are cared for by their parents (Oriet et al., 2014). According to Steadman Group's (2007), study on children's gender and age found boys to be naturally stubborn and they take more interests on things quickly and lose interests fast. Girls usually take interest on issues slowly and they keep it, they can practice hand washing better than boys because boys are careless while older children can do hand washing with soap much better because they know the dangers. A study by Mamboleo, et al., (2015), found childcare institutions which used water from rains and shallow wells had 86.7% diarrheal diseases.

According to Bryce et al., (2013), children's health needs a high impact intervention to be availed and used by every child who needs it. Diarrheal diseases in childcare institutions need to be addressed.

## 2. MATERIALS AND METHOD

The study looked at diarrheal diseases in relation to the children's age, gender, duration of a child's stay in a childcare institution and use of soap in hand washing among children in childcare institutions. A cross-sectional research design was used in this study which was conducted in Uasin Gishu County's registered child-care institutions. The study was approved by the Institute of Research

and Ethical Committee of Moi University and Moi Teaching and Referral Hospital Board. Permission to collect data from childcare institutions was sought from Uasin Gishu County’s children’s officer and from the respective childcare institution’s managers. For those children who were below 18 years old a second consent was sought from them before they were involved in the study. A study sample size was determined using Mugenda and Mugenda (2003) formulae,  $n^f = n / (1+n) / N$ . A sample size of 202 children was selected from a study population of 427 children above 6 years old. Systematic random sampling method was used in selecting respondents of the study. Data was collected using pre-tested interview schedule questionnaires which were prepared to address diarrheal diseases in all registered childcare institutions in the county.

The collected data was arranged; errors removed, coded and analyzed using SPSS Version 20. Analyzed results were presented in descriptive statistics, frequencies, distribution tables, means and standard deviation. Chi-square and multiple logistic regressions were computed to establish levels of association between the variables under study. Level of significance of a P-value of <0.05 was considered statistically significant.

**3. RESULTS AND DISCUSSION**

Table 1 shows demographic distribution of the study sample

**Table1.** *Children’s demographic characteristics in Uasin Gishu childcare institutions*

| <b>Gender:</b> | <b>No:</b> | <b>Percentage</b> |
|----------------|------------|-------------------|
| Male           | 133        | 65.8%             |
| Female         | 69         | 34.2%             |
| <b>Age:</b>    |            |                   |
| 6-10 yrs.      | 69         | 34.2%             |
| 11-15 yrs.     | 75         | 37.1%             |
| 16-20yrs.      | 55         | 27.2%             |
| >20yrs.        | 3          | 1.5%              |

Diarrheal disease is a common health problem, which affects children across all age groups. This disease is transmitted from one individual to the other through fecal-oral contamination with food or water. Most children who contracted diarrheal diseases must have had a history of poor hygienic background of either inadequate or untreated water, inadequate latrines or lack of hand washing with soap after toilet. Many children who were in Uasin Gishu childcare institutions during the study had been in these institutions between 2-10 years. These institutions had 133 (65.8%) boys and (69) 34.2% girls. These study findings concurred with Winged (1984) whose study found more boys developing deviant behaviors easily, abandoning school and escaping to urban areas to look for a more friendlier environments where they thought they, could get their needs more easily and faster as they needed. A girl child can only come to the streets when she lacks protection at her home, or she has been, abused or raped by her close relatives who are supposed to provide protection for them unlike boys who abandon their homes because of having been induced by their peers for the economic necessity (Appear et al; 2007).

Many children in the streets eventually find their resting places in childcare institutions although some of them come from well-known established or poor families.

Children in Uasin Gishu childcare institutions varied in age, with majority of them between 11-15 years old. This age group represented 37.1% of Uasin Gishu Childcare institutions’ children. Studies by Muchini (2000) in Zimbabwe found 42.2% of the children in Zimbabwean streets were of the same age brackets. Studies show this age as the most deviant and highly abused with the largest percent of children in the streets and in childcare institutions. A study by Zucker et, al., (2008) on children aged between 11-15 years old found the social environment, peer groups, school community, and the larger macro systems of a society or a family with a history of antisocial behaviors, child maltreatment, and other negative life experiences are precursors of children’s later behavior. Table-2 shows the relationship between children’s age and hand washing with soap after toilet.

**Table2.** *Hand washing with soap after toilet per age*

| <b>Age</b>         | <b>Those who used soap</b> | <b>Did not use soap</b> | <b>Total</b> |
|--------------------|----------------------------|-------------------------|--------------|
| 6-10 yrs.          | 31                         | 38                      | 69           |
| % within Age group | 44.9%                      | 55.1%                   | 100%         |
| 11-15 yrs.         | 49                         | 26                      | 75           |
| % within Age group | 65.3%                      | 34.7%                   | 100%         |

|                                  |              |             |             |
|----------------------------------|--------------|-------------|-------------|
| 16-20 yrs.<br>% within Age group | 47<br>85.5%  | 8<br>14.5%  | 55<br>100%  |
| >20 yrs.<br>% within Age group   | 3<br>100%    | 0           | 3<br>100%   |
| Total percentage per age         | 130<br>64.4% | 72<br>35.6% | 202<br>100% |

The rate of hand washing with soap after toilet increased with increase in children’s age table-2.This could be due to awareness of using soap to wash hands after toilet. Relationship between gender and use of soap in hand washing after toilet is shown in table 3.

**Table3.** Relationship between gender and use of soap in hand washing after toilet’s behavior

| Gender | Use of Soap      | Yes   | No    | Total  |
|--------|------------------|-------|-------|--------|
| Boys   | Count            | 72    | 61    | 133    |
|        | % within Gender  | 54.1% | 45.9% | 100.0% |
| Girls  | Count            | 58    | 11    | 69     |
|        | % within Gender  | 84.1% | 15.9% | 100.0% |
| Total  | Count            | 130   | 72    | 202    |
|        | % within Genders | 64.4% | 35.6% | 100%   |

Table 3 shows 84.1% girls used soap to wash hands after toilet compared to 54.1% boys in Uasin Gishu Childcare institutions. The study observed that girls were hygienically conscious in hand washing with soap after toilet than boys.

A study in Busenyi primary school in Uganda by Steadman Group (U) Ltd (2007), on children between grades one and six; by age and gender established that boys were naturally stubborn because they take interest on issues very quickly and loses interest very fast, while a girl child takes interest slowly and they keeps them for a long period of time.

A girl child practiced hand washing much better than boys who are found to be careless. Table 4 relates the period a child was in a childcare institution and use of soap in hand washing after toilet.

**Table4.** The period a child had stayed in a childcare institution and use of soap in hand washing after toilet behavior

| Period a child was in institution | Use of soap in hand washing | Yes         | No        |
|-----------------------------------|-----------------------------|-------------|-----------|
| <1 yr                             | Count                       | (12)        | (12)      |
|                                   | % within period in CCI      | 50.0%       | 50.0%     |
| 2-5 yrs                           | Count                       | (57)        | (41)      |
|                                   | % within period in CCI      | 58.2%       | 41.8%     |
| 6-10yrs                           | Count                       | (58)        | (19)      |
|                                   | % within period in CCI      | 75.3%       | 24.7%     |
| >10 yrs                           | Count                       | (3)         | (0)       |
|                                   | % within period in CCI      | 100.0%      | 0%        |
| Count                             |                             | (130) 64.4% | (72)35.6% |

Table 4 shows the period a child had stayed in a childcare institution and hand washing with soap’s habit. The study established that the longer the child stayed in a childcare institution the more his/her hand washing habit increased. A study by Steadman group (2007), on hand washing with soap after toilet’s habit in Bushenyi District Uganda by gender and age indicated that the older the child the more he /she used soap to wash their hands because they knew the dangers of not washing hands with soap after toilet. Most children in childcare institutions seemed to have come from the status where a hand washing habit was not frequently practiced. Table: 4showsthat the longer the child stayed in a child care institution the more he/she learned on the importance of using soap in hand washing after toilet. The study shows most children in childcare institutions in Uasin Gishu must have come from environments where hand washing with soap was not a routine habit.

Table 5demonstrates the relationship between children’s age, gender, the duration a child has been in a childcare institution and using soap to wash hands after toilet.

## The Prevalence of Diarrheal Diseases in Childcare Institutions, Uasin Gishu County, Kenya

**Table5.** Chi-square analysis on hand washing with soap after toilet in childcare institutions

| Demographic                     | Pearson's Chi-Square Value | df | Asymp. Sig. (2-sided) |
|---------------------------------|----------------------------|----|-----------------------|
| Children age                    | 18.871 <sup>a</sup>        | 3  | 0.001                 |
| Gender                          | 17.733 <sup>a</sup>        | 1  | 0.001                 |
| Period a child has been in CCIs | 9.495 <sup>a</sup>         | 3  | 0.023                 |

Chi-square analysis showed a significant relationship between children's age, gender, period the child had stayed in a child care institution and use of soap in hand washing after toilet.

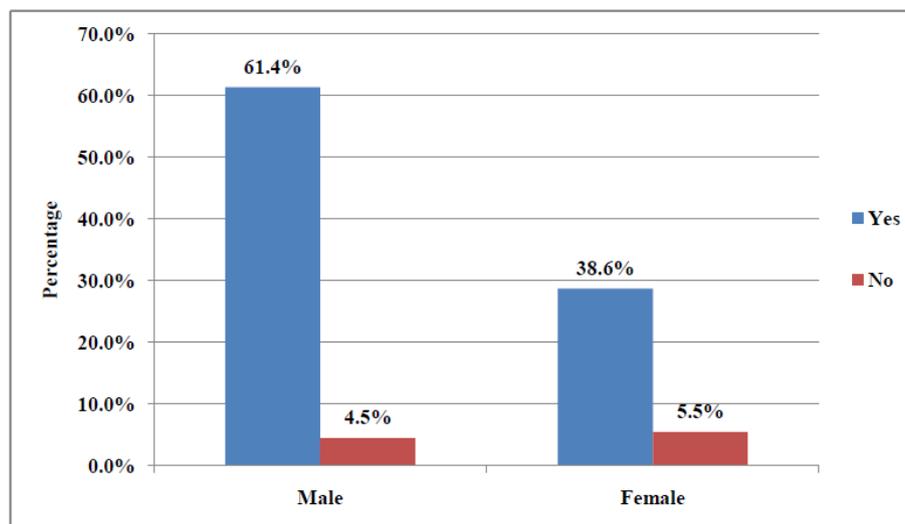
**Table6.** Shows an association between children's age and diarrhea diseases

| Age         | Diarrhea     | Yes   | No    | Total |
|-------------|--------------|-------|-------|-------|
| 6-10Years   | Count        | 61    | 8     | 69    |
|             | % within Age | 88.4% | 11.6% | 100%  |
| 11-15 Years | Count        | 70    | 5     | 75    |
|             | % within Age | 93.3% | 6.7%  | 100%  |
| 16-20Years  | Count        | 49    | 6     | 55    |
|             | % within Age | 89.1% | 10.9% | 100%  |
| >20 Years   | Count        | 2     | 1     | 3     |
|             | % within Age | 66.7% | 33.3% | 100%  |
| Total       | Count        | 182   | 20    | 202   |
|             | % within Age | 90.1% | 9.9%  | 100%  |

Table 6 illustrates that 90.1% of the children in childcare institutions had diarrhea irrespective of their age. A study by Nwadiaro et al., 2015 in day-care centers on high, middle and low income countries found health promotion on hand washing with soap after toilet reduced diarrheal diseases by about 30%.

Most diarrheal diseases in Uasin Gishu childcare institutions were attributed to lack of hand washing with soap after toilet while the rest could have been due to other causes. Some of which are highlighted by (Mamboleo, et al., 2015), whose chi-square analysis showed a significant relationship ( $\chi^2=9.114$ ,  $df=3$  and  $p=0.028$ ) between children's age and diarrheal diseases.

A comparison study was done to check for the difference between gender and diarrheal diseases' prevalence in childcare institutions (Fig 1).



**Figure1.** Children's gender and diarrheal disease prevalence

Chi-square analysis realized a significant relationship ( $\chi^2=4.287$ ,  $df=1$  and  $p=0.038$ ) between gender and diarrheal diseases' prevalence at (61.4% boys and 38.6% girls). This low rate of diarrheal diseases in girls' was attributed to the fact that girls observed cleanliness more than boys.

#### 4. CONCLUSION AND RECOMMENDATIONS

Diarrhea was a common communicable disease in Uasin Gishu childcare institutions. The disease affected (90.1%) children. The disease affected 61.4% boys and 38.6% girls. Infection rate of diarrheal diseases reduced with increase in children's age. It was found that hand washing using soap after

toilet increased in reducing diarrheal diseases. This study recommends hand washing using soap after toilet in childcare institutions, should be made a major healthcare campaigns issue to all childcare institutions, with more emphasizes to the newly admitted young boys.

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#### FOOT NOTES

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