

**FACTORS INFLUENCING UPTAKE OF WATER, SANITATION AND HYGIENE  
PRACTICES AMONG CHILDREN IN EARLY CHILDHOOD DEVELOPMENT  
SCHOOLS IN NYANDO SUB COUNTY, KENYA**

**BY**

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(HEALTH PROMOTION AND INTERNATIONAL HEALTH)**

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**DECLARATION**

This thesis is my original work and has not been presented for an award of a degree or Diploma in any other university or institution.

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## **DEDICATION**

To my husband, Dr. Nicholas Ogweno Nyasoro whose enthusiasm, encouragement, and spiritual support motivated me to continue with my studies, my three children, Keith Olang, Kacie Awuor and Kayla Amor for your empathy, which gave me the opportunity to concentrate and undertake this research, and to my parents, John and Margaret Okwiri for always believing in my potential and encouraging me to undertake this course. I dedicate this work to all of you.

## ABSTRACT

The World Health Organization (WHO) defines sanitation as access to and use of facilities and services, for the safe and disposal of human excreta. It further describes hygiene as the conditions and practices aimed at maintaining health and preventing the spread of diseases. Globally, it is estimated that in 2017, 2.7 million children below the age of five died due to preventable diseases caused by poor water, sanitation, and hygiene practices. In developing countries, an estimated 88% of the childhood morbidities are caused by unsafe drinking water, inadequate sanitation and hygiene. According to the Kenya Environmental Sanitation and Hygiene Policy 2016-2030, ECD schools still do not have adequate access to safe water and sanitation facilities. In Kisumu County, according to the district health information system (DHIS2), Nyando Sub County reported the highest incidence of preventable illnesses often associated with poor water, sanitation, and hygiene practices among ECD going children as compared to the other rural sub counties in the last four years. In the year, 2018, a total of 3,969 cases of WASH related illnesses were reported in the Sub County between January to June. This study sought to assess the factors influencing uptake of water, sanitation, and hygiene practices among children in early childhood and development schools in Nyando Sub County, Kenya. The specific objectives were to; determine the level of knowledge of teachers on WASH, and its influence on children's WASH practices, determine the status of WASH facilities in the ECD schools, establish the WASH practices of children in the ECD schools and to assess the measures put in place to ensure sustained access to water, sanitation, and hygiene services in ECD schools in Nyando Sub County. A cross-sectional study design adopting qualitative and quantitative research approaches was used. Study population was 217 ECD teachers and 422 children in 132 schools. Random sampling technique was used to select participating schools, teachers and children. A pretested questionnaire, observation checklist and KII guide were used to collect data. Quantitative data was entered; cleaned and both descriptive and inferential statistical analysis done using Stata. Statistical significance of the variables was tested at a *p*-value of  $p=0.05$  and association tested by use of chi square test at 95% confidence interval. The data was grouped according to respective themes. Analysis and interpretation was done using narratives, with results displayed in graphs, tables and charts. The study established that teacher's knowledge on water sources ( $P=0.012$ ), water treatment technologies ( $P=0.006$ ) and proper toilet use ( $P=0.026$ ) had significant relationship with the uptake of WASH among the children in the ECD schools. The teachers had accurate knowledge on water, sanitation and hygiene. The ECD schools had functional WASH facilities, however the sanitation facilities had foul smell and presence of urine and anal cleansing materials on the floors. On observation of the children's WASH practices, 257 (61%) of the children washed hands after visiting the toilet, 207 (49%) did not crowd at the drinking water source and 224(53%) did not properly use the toilet. Sustainability measures in place included Intersectoral collaboration and advocacy for increased funding for WASH in ECD schools. In conclusion, the level of knowledge of teachers on WASH and availability of WASH infrastructure influence the uptake of WASH practices among Children in ECD schools in Nyando. The study recommended the provision of educational materials to teachers on WASH that are relevant to teach ECD children. The study further suggests that the County Government of Kisumu should prioritize WASH interventions in ECD schools to improve the health and educational outcomes of children in ECD schools in Nyando sub county and by extension Kisumu County.

## TABLE OF CONTENTS

DECLARATION .....	ii
ACKNOWLEDGEMENT .....	iii
DEDICATION .....	iv
ABSTRACT .....	v
TABLE OF CONTENTS.....	vi
LIST OF ABBREVIATIONS AND ACRONYMS .....	xi
OPERATIONALIZATION OF CONCEPTS.....	xii
LIST OF TABLES .....	xiii
LIST OF FIGURES .....	xiv
<b>CHAPTER ONE: INTRODUCTION .....</b>	<b>1</b>
1.1 Background Information .....	1
1.2 Problem Statement .....	3
1.3 Study Objective.....	4
1.3.1 Main Objective.....	4
1.3.2 Specific Objectives .....	4
1.3.3 Research Questions.....	4
1.4 Significance of the study.....	5
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>6</b>
2.1 Introduction.....	6
2.2 Knowledge level of teachers on Water, Sanitation and Hygiene.....	6
2.3 Water, Sanitation and Hygiene Facilities and Practices in Schools.....	8
2.3.1 Sources of water, storage facilities and water treatment practices .....	8
2.3.2 Types, conditions and use of sanitation facilities .....	9
2.3.3 Hand washing Facilities and practices in Schools .....	10
2.4 Promoting Sustainable access to Water, Sanitation and Hygiene in Schools.....	11
2.5 Theoretical Framework.....	12
2.6 Conceptual Framework.....	13
<b>CHAPTER THREE: METHODOLOGY.....</b>	<b>15</b>
3.1 Introduction.....	15
3.2 Study Area .....	15
3.3 Research Design.....	15
3.4 Study Population.....	16

3.4.1 Target Population.....	16
3.4.1.1 Inclusion Criteria .....	16
3.4.1.2 Exclusion Criteria .....	16
3.5 Sampling Design .....	16
3.5.1 Sample size determination .....	16
3.5.2 Sampling Procedure .....	18
3.6 Data Collection .....	19
3.6.1 Data Collection Tools .....	19
3.6.2 Data Management .....	20
3.6.3 Quality control .....	20
3.7 Piloting.....	20
3.8 Validity of Instrument.....	20
3.9 Reliability of Instruments .....	21
3.10 Data Analysis and Presentation .....	21
3.10.1 Quantitative data analysis .....	21
3.10.2 Qualitative data analysis .....	21
3.10.3 Data Presentation .....	21
3.11 Delimitations and Limitations.....	22
3.12 Ethical Considerations .....	22
<b>CHAPTER FOUR: FINDINGS.....</b>	<b>23</b>
4.1 Introduction.....	23
4.2 Level of knowledge of teachers in ECD schools on water, sanitation and hygiene and its influence on the children’s wash practices in Nyando sub county. ....	23
4.2.1 Socio-demographic Characteristics of respondents .....	23
4.2.2 Education Level of teachers in ECD schools in Nyando .....	24
4.2.3 Source of knowledge on water, sanitation and hygiene.....	25
4.2.3.1 Ever received any training/information on safe water, sanitation and hygiene .....	25
4.2.3.2 Length of training/workshop on safe water sanitation and Hygiene .....	26
4.2.3.3 Teacher Training on WASH .....	27
4.2.3.4 What can be done to improve on the training .....	27
4.2.3.5 Topics covered on safe water, sanitation and hygiene promotion .....	28
4.2.3.6 Refresher training/information/ courses received on safe water, sanitation and hygiene .....	29

4.2.3.7 Facilitator for refresher trainings .....	30
4.2.3.8 Educational materials provided.....	30
4.2.3.9 Importance of documents provided .....	31
4.2.4 Level of knowledge of teachers on water and its influence on children’s WASH Practices .....	31
4.2.4.1 Knowledge on sources of water.....	31
4.2.4.2 Teachers knowledge on the importance of making water safe for drinking.....	32
4.2.4.3 Teachers knowledge on safe water treatment techniques .....	33
4.2.5 Level of knowledge of teachers on sanitation and its influence on children’s WASH practices .....	34
4.2.5.1 Knowledge on disposal of human faeces.....	34
4.2.5.2 Teachers knowledge on the importance of having and using a toilet.....	35
4.2.5.3 Teachers knowledge on proper toilet use.....	35
4.2.6 Level of knowledge of teachers on hand washing practices and its influence on Children’s WASH practices.....	36
4.2.6.1 Teachers knowledge on critical times to wash your hands.....	36
4.2.6.2 Knowledge of teachers on the importance of washing hands using water and soap ...	37
4.2.7 Level of knowledge of teachers on feecal oral diseases and its influence on children’s WASH practices.....	38
4.2.7.1 Knowledge of teachers on faecal-oral disease transmission.....	38
4.2.7.2 Knowledge of teachers on faecal-oral transmission disease.....	39
4.3. The status of the wash facilities in ECD schools in Nyando Sub- County.....	39
4.3.1 The status of drinking water facilities in ECD schools in Nyando sub-county .....	39
4.3.2 Treatment equipment .....	41
4.3.3 Challenges faced by Children with a disability or special needs in getting drinking water without assistance .....	41
4.3.4 Points of used water discharge.....	42
4.3.5 Other observations .....	42
4.3.6 Sanitation facilities.....	42
4.3.6.1 Condition of the sanitation facilities .....	43
4.3.6.1.1 Condition of the toilets.....	44
4.3.6.2 Toilet adaptations for youngest students.....	44
4.3.6.3 Type of Material .....	45



4.3.7 Hand washing with soap .....	46
4.3.8 Overall status of WASH facilities.....	47
4.4 Wash practices of children in ECD schools within Nyando Sub -county .....	47
4.4.1 Dissemination of health and hygiene education at school .....	47
4.3.2 WASH activities in the ECD schools .....	48
4.4.3 Implementation of Health and Hygiene activities/ Education .....	48
4.4.4 Delivery of Health and hygiene messages to pupils in ECD schools .....	49
4.4.5 Pupils’ involvement in health and hygiene promotion activities at schools.....	50
4.4.6 Confidence in teaching .....	51
4.4.7 Discussions on general hygiene behaviors by teachers during staff meetings .....	52
4.4.8 Children’s WASH Practices .....	53
4.5 Measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando sub-county .....	53
4.5.1 Sustainability Measures put in place.....	53
4.5.1.1 WASH Challenges in ECD schools.....	53
4.5.1.2 Interventions in place to address the challenges .....	54
4.5.1.3 Sustainability Measures in Place .....	55
4.6 Summary of Findings.....	55
4.6.1 Level of Knowledge of Teachers in ECD Schools on WASH and its influence on Children’s WASH Practices. ....	55
4.6.2 Status of the WASH Facilities in ECD Schools in Nyando Sub County.....	57
4.6.3 WASH Practices of Children ECD Schools within Nyando Sub County .....	58
4.6.4 Sustainability Measures in Place to ensure sustained access to WASH services in ECD Schools in Nyando Sub County .....	59
<b>CHAPTER FIVE: DISCUSSION.....</b>	<b>60</b>
5.1 Introduction.....	60
5.2 Discussion .....	60
5.2.1 Level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children’s WASH practices .....	60
5.2.2 Status of WASH facilities in ECD schools in Nyando Sub County .....	61
5.2.3 WASH practices of Children in ECD Schools .....	62
5.2.4 Measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools.....	63

<b>CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS .....</b>	<b>64</b>
6.1 Introduction.....	64
6.2 Conclusion .....	64
6.3 Recommendations.....	64
6.4 Suggestions for further research .....	65
<b>REFERENCES.....</b>	<b>66</b>
<b>APPENDICES .....</b>	<b>72</b>

## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>WASH</b>	Water Sanitation and Hygiene
<b>W H O</b>	World Health Organization
<b>JMP</b>	Joint Monitoring Programme
<b>DHIS</b>	District Health Information System
<b>ECD</b>	Early Childhood and Development
<b>SDG</b>	Sustainable Development Goals
<b>KESH</b>	Kenya Environmental Sanitation and Hygiene
<b>WINS</b>	WASH in Schools
<b>K-CEN</b>	Kisumu County Education Network
<b>FPE</b>	Free Primary Education

## OPERATIONALIZATION OF CONCEPTS

**Improved drinking water source:** In this study, this refers to a source that is able to deliver safe drinking water at the premises, is available when needed and is safe from contamination

**Improved sanitation facility:** In this study, this refers to a facility that is able to separate excreta from any human contact in a hygienic way

**Improved handwashing facility:** In this study, an improved handwashing facility is one that is strategically located and has water and soap available at all times.

**Improved WASH Practices:** In this study, improved WASH practices refer to enhanced knowledge on WASH by both pupils and teachers, handwashing with soap, appropriate use of sanitation facilities and consumption of safe drinking water.

**Improved WASH Services:** In this study, this refers to the availability and sustained access to improved Water, Sanitation and hygiene facilities in ECD schools

## LIST OF TABLES

Table 4.1: Distribution of respondents of Nyando Sub-County (Source: Author).....	24
Table 4.2: Training/ Information received among respondents of Nyando Sub-County (Source: Author).....	26
Table 4.3: Length of Training/ Workshop among respondents of Nyando Sub-County (Source: Author).....	26
Table 4.4: How helpful were the documents provided (Source: Author).....	31
Table 4.5: Knowledge towards Water (Sources of Water) (Source: Author).....	32
Table 4.6: Importance of making water safe for drinking (Source: Author).....	33
Table 4.7: Safe Water Treatment Techniques (Source: Author).....	34
Table 4.8: Knowledge towards Sanitation (Disposal of Human Faeces) (Source: Author)....	34
Table 4.9: Knowledge towards Sanitation (Importance of having a toilet) (Source: Author).	35
Table 4.10: Knowledge towards Hand washing practices (Importance of washing hands using soap and water) (Source: Author).....	38
Table 4.11: Status of WASH Facilities- Access to water (Source: Author).....	40
Table 4.12: Status of WASH Facilities (points of used water discharge) (Source: Author)....	42
Table 4. 13: Status of WASH Facilities (points of used water discharge-other observations) (Source: Author).....	42
Table 4.14: Status of WASH Facilities (Access to sanitation) (Source: Author).....	43
Table 4.15: Status of WASH Facilities (Access to sanitation-condition of toilets) (Source: Author).....	43
Table 4.16: Status of WASH Facilities (Access to sanitation-condition of toilets) (Source: Author).....	44
Table 4.17: Status of WASH Facilities (Access to sanitation-toilet adaptations) (Source: Author).....	45
Table 4.18: Status of WASH Facilities (Access to sanitation-type of material used) (Source: Author).....	46
Table 4.19: Status of handwashing facilities (Source: Author).....	46
Table 4.20: Status of WASH Facilities (Access to sanitation-status of WASH facilities) (Source: Author).....	47
Table 4.21: Dissemination of health and hygiene education at school (Source: Author).....	47
Table 4.22: Pupils Involvement in WASH activities (Source: Author).....	51
Table 4.23: Confidence in teaching (Source: Author).....	51
Table 4.24: Discussions on general hygiene behaviors (Source: Author).....	52

## LIST OF FIGURES

Figure 4.1: Education level of Respondents (Source: Author).....	25
Figure 4.2: Was the Training sufficient (Source: Author).....	27
Figure 4.3: What can be done to improve the Training (Source: Author).....	28
Figure 4.4: Topics covered on safe water, sanitation and hygiene among respondents of Nyando Sub-County (Source: Author).....	29
Figure 4.5: Refresher Trainings/ information/ courses received on Water, Sanitation and Hygiene (Source: Author).....	29
Figure 4.6: Refresher Trainings Facilitators (Source: Author).....	30
Figure 4.7: Educational Materials provided during trainings (Source: Author).....	30
Figure 4.8: Knowledge towards Sanitation (Proper Toilet Use) (Source: Author). ....	36
Figure 4.9: Knowledge towards Hand washing practices (Critical times to wash hands) (Source: Author).....	37
Figure 4.10: Knowledge towards Diseases (Knowledge on faecal oral diseases) (Source: Author).....	38
Figure 4.11: Knowledge towards Diseases (Meaning of faecal oral disease transmission) (Source: Author).....	39
Figure 4.12: Status of WASH Facilities (Treatment equipment) (Source: Author). ....	41
Figure 4.13: Status of WASH Facilities (disability barriers) (Source: Author). ....	41
Figure 4.14: Dissemination of health and hygiene activities- who conducts the activities (Source: Author).....	48
Figure 4.15: Implementation of health and hygiene activities/ education) (Source: Author).49	
Figure 4.16: Delivery of health and hygiene messages to pupils in ECD schools (Materials for hygiene promotion) (Source: Author).....	50
Figure 4.17: Children’s WASH Practices (Observation of pupils using WASH facilities) (Source: Author).....	53

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background Information**

This chapter presents an introduction to the study under the following sub-sections: background information, statement of the problem, justification, research objectives and research questions.

Sanitation is defined as the accessibility and use of facilities to safely dispose off human excreta in a hygienic way, that upholds human and community health (WHO, 2018). WHO further describes hygiene as the conditions and practices that aid in the prevention of diseases and preservation of health (WHO, 2018). According to the Joint Monitoring programme (JMP, 2018), water is considered safe if it is from an improved source that is reliable and adequate to cater for all needs including hand washing. The combination of Water, Sanitation and hygiene (WASH) therefore refers to sustainable supply of safe drinking water, proper disposal of human waste and hygiene promotion activities that are aimed at attaining sustainable healthy behavioral Practices (WHO, 2011).

Historically, water, sanitation and hygiene resources determined human settlements, which mainly developed where there was availability of water, such as near rivers or lakes (Grant, 2020). As cities grew due to urbanization, unsanitary conditions and overcrowding prevailed. This resulted in pandemics such as cholera which killed millions of people (Crawford, 2011). In addition, very high infant and child mortality cases were reported due to deficiencies in safe water and sanitation. Studies thereafter established the link between water, sanitation, and hygiene (Juuti, 2020). Investigations by the physician John Snow revealed that the waterborne diseases were caused by consumption of contaminated drinking water (Tulchinsky, 2018). After this discovery, the promotion of community WASH interventions became crucial in prevention of waterborne diseases and was adopted by epidemiologists and public health practitioners.

Theoretically, WASH studies among children are guided by the social cognitive learning theory. The theory postulates that knowledge gain occurs by observation based on social interaction with others and the experiences shared. The learning process entails paying attention while being taught, retaining the information gained, practicing what has been learnt and being motivated to sustain the good behavior. Children learn by observing the practices of their care givers, they adopt the desirable behaviors, especially if encouraged and

applauded or are given rewards based on the replication of desirable practices. The positive reinforcement promotes the adoption and retention of behavior. The theory proposes the principle of three interacting elements which are personal factors, the Environment and behavior. These three essentials work in a reciprocal nature to shape the behavior and practices of the children, ultimately having an influence on their health outcomes.

Conceptually, early childhood and development (ECD) schools refer to pre-school education facilities for nurturing children of ages between three to six years (Charlesworth, 2012). The early childhood period in a human's life begins at conception to eight years of age. During this period, active brain development takes place and children learn from their surroundings and caregivers (WHO, 2012). Children at this stage require proper nutrition, health, protection, and training to reach their full potential. Studies indicate that access to safe water, handwashing, and sanitation facilities in ECD schools can reduce cases of WASH related illnesses among young children (Bowen, 2007). In this regard schools are expected to have adequate WASH services (JMP, 2018). These entail sanitation facilities that are clean, and gender segregated, accessible and safe drinking water that is accessible to the school population with provision of hand washing facilities, strategically placed to encourage proper hand hygiene (WHO, 2009).

Factors that influence uptake of hygiene practices in ECD schools include enhanced knowledge of teachers on WASH, presence of functional WASH infrastructure and continuous health and hygiene sensitization on the importance of good hygiene (Chittleborough, 2012). Other factors include presence of active school health clubs and participating in exchange visits to model schools with appropriate WASH facilities (Muzaku, 2011). These factors contribute to increased awareness of health aspects with regard to improved WASH behaviors and further determines the degree of sustainability of the WASH interventions (Kinley, 2011).

Globally, it is estimated that in 2017, 5.4 million deaths occurred in children below years, with more than half resulting from poor sanitation, water, and hygiene practices (UNICEF, 2018). The Sustainable Development Goals further (SDG) stresses the importance of WASH in ECD under goal 3, goal 4 and goal 6. The three goals aim at enhancing the health and well-being of children under five by providing an environment that is conducive for their learning and growth, through the provision of adequate WASH services (UN,2015). To attain and meet the SDGs, the world over should strive to have universal access to WASH in schools by



ensuring basic WASH services are provided in ECD schools so as to cater for all age groups (JMP, 2018). In sub-Saharan Africa, 842,000 deaths are caused by inadequate WASH. This represents 58% of total mortalities caused by diarrhea and 1.5% of morbidity cases among children in the sensitive age cohort of 5 years and below (WHO, 2014). The region experiences the biggest challenge with approximately 330 million people depending on unimproved drinking water sources and 565 million without improved sanitation services (UNICEF, 2018).

According to the Joint WASH monitoring report of 2018, basic drinking water services coverage is lower in rural schools in sub-Saharan Africa as compared to urban schools (JMP, 2018). In Tanzania, a school WASH mapping report conducted in 2010, revealed that most primary schools share WASH facilities with the ECDs. It also showed that 73% of ECDs in the country do not meet the basic WASH standards. This has contributed to the WASH related diarrheal cases among children in the country. In Kenya, article 43 of the Kenyan constitution states that all Kenyans including children have the right to improved and sustainable WASH services (Constitution of Kenya, 2010). Approximately 62% of the Kenyan population access safe and reliable water sources, while 30% access improved sanitation services (WHO/UNICEF, 2014). The situation has been exacerbated by inception of free primary education in 2003 which over stretched the limited available infrastructure and basic WASH facilities in most primary and ECD schools in Kenya (Kenya WINs Report, 2013).

In Kisumu County, 55.2% and 58.1% of the population access improved water and sanitation respectively (KNBS/SIDS, 2012). The schools WASH situation as depicted by the county report on the status of basic education indicates that 65.48% of ECD pupils share pit latrines with the primary school pupils (K-CEN, 2014). In Nyando sub-County, 88 % of ECD schools rely on rainwater during the rainy season and 45% use unprotected surface water during the dry season (SWASH Plus Baseline report, 2008). Only 5.3% of the schools reported to practice safe water treatment methods mainly using water guard. This study will therefore assess factors influencing uptake of WASH among children in ECD schools within Nyando Sub County.

## **1.2 Problem Statement**

According to the District Health information system (DHIS2), between 2014 and 2019, Nyando Sub County reported the highest number of WASH related illnesses among ECD going children as compared to the other rural sub counties in Kisumu County. The common

water related illnesses in Nyando sub county among the children under five was mainly diarrhea. In the year 2018, a total of three thousand nine hundred and sixty-nine (3969) cases were reported between January to June (DHIS2). This was 1,274 cases higher than Seme Sub County which ranked second among the rural sub counties with regard to illnesses attributed to poor WASH conditions among children under-five. As per the Kenya early childhood development standard service guideline, all ECDs are required to have toilets for boys, girls and teachers. The toilet-child ratio in the ECD schools should be 1: 25 (ECD standard service guideline, 2006) and specially designed for young children. In addition, the schools should also provide safe drinking water and handwashing facilities to enhance improved WASH practices among the school children. Based on the foregoing information, this study was conducted to assess factors influencing uptake of water, sanitation and hygiene practices among children in ECD schools in Nyando sub-county.

### **1.3 Study Objective**

#### **1.3.1 Main Objective**

To assess factors influencing uptake of water, sanitation, and hygiene practices among children in ECD schools in Nyando Sub County, Kisumu County, Kenya

#### **1.3.2 Specific Objectives**

- i. To determine the level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children's WASH practices in Nyando Sub County
- ii. To determine the status of the WASH facilities in ECD schools in Nyando sub county
- iii. To establish the WASH practices of children in ECD Schools within Nyando sub county
- iv. To assess the measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County

#### **1.3.3 Research Questions**

- i. How does the level of knowledge of teachers in ECD schools on Water, Sanitation and hygiene influence children's WASH practices in Nyando Sub County?
- ii. What is the status of the water, sanitation and hygiene facilities in ECD schools in Nyando Sub County?

- iii. What are the WASH practices of children in ECD schools within Nyando Sub County?
- iv. What are the measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County?

#### **1.4 Significance of the study**

The evidence generated from this study may be used to inform the need for sustainable WASH intervention strategies in ECD schools to align with the Kenya National School health policy, the Kenya National Environmental Health and Sanitation Policy and ECD guidelines. In addition, this data will be useful to the National Government and County Government of Kisumu, implementing partners and donors as it will anchor the implementation and development of future WASH programming in ECD schools. It will further inform implementation frameworks that target WASH concerns related to ECD schools and resource prioritization aimed at improving the health and educational outcomes of children in ECD schools in Nyando Sub County and by extension Kisumu County.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter provides a critical review of literature related to water, sanitation and hygiene practices in schools. It is discussed under the following sub-headings: Knowledge level of teachers on WASH, Water, sanitation and hygiene facilities and practices in schools and Measures put in place to ensure sustained access to Water, Sanitation and Hygiene in Schools. The section also covers the conceptual framework under which the study is based on.

#### **2.2 Knowledge level of teachers on Water, Sanitation and Hygiene**

Educational training and sensitization sessions on WASH is a sustainable approach aimed at promoting the adoption of good WASH behaviors especially among children in ECD schools (Mooijman, 2010). Children are considered to be fast learners as they can easily alter their behavior or develop new practices based on increased knowledge and facilitated practice as learned from their social environment. When children are introduced to new WASH ideas and practices while in school, the information triggers their thoughts on existing practices in their homes and at schools which they begin to question. Teachers play a key role in demonstrating good hygiene behaviors and in turn, the children learn from their teachers and there after adopt improved hygiene practices which they replicate within their households and communities. (Olayiwole, 2016).

In developing countries, studies have indicated that students enrolled schools that conduct WASH education sessions acquire improved hygiene behaviors and skills. This is mainly done through practical demonstrations, verbal directions and use of posters to reinforce the importance of adoption of improved WASH practices (Karon,2017). These students in turn share the knowledge gained with their families and subsequently adopt improved WASH behaviors (Karon, 2017). Teachers are able to deliver WASH information to children once they have been equipped with adequate knowledge and educational resource materials to support the activities. A survey conducted by SNV in 64 rural schools Asia revealed that majority of the teachers had not received adequate educational materials on WASH or any training from the regional educational staff on national school WASH policies and guidelines. The organization went ahead and trained the teachers on the delivery of sanitation and hygiene modules which resulted in increase in knowledge on WASH by the

schoolteachers, children and improved WASH practices at school (SNV briefing paper, 2013). Other studies conducted on handwashing among school children showed that the involvement of teachers in promoting handwashing with soap is exciting for the children. This is because the teachers apply active teaching methods that include rewards, games and hand washing with soap demonstrations which ultimately led to improvement in the practice among the children at school (lethithanhxuan, 2016). Teachers are central in the delivery of WASH information and adoption of WASH practices as they are influential in shaping the children's capacities to become role models in the communities (WHO, 2014). To improve on the School WASH practices, there is need to strengthen the capacities of teachers especially in ECD Schools on WASH to support the various WASH promotion activities. Subsequent studies conducted on the factors that motivate proper hand washing in schools and at home include getting rid of dirt, excreta, smell after defecation and for cleanliness purposes. All these reasons are associated with better socioeconomic status as a result of reduced WASH related illnesses (Jason,2012).

A study conducted on the hygiene practices and hand hygiene among children attending primary schools in one of the developing countries, indicated that it is important to have visual reminders in form of pictorials, wall murals or posters on the importance of improved hygienic practices. These reminders act as nudges and help in sustaining the practice. This can also be done through classroom teaching or through information, education, and communication (IEC) materials strategically placed near hand washing stations and sanitation facilities (Padaruth,2015). Teachers are the role models of children when it comes to improved WASH practices in school. In Ghana, studies have revealed that pupils who have received information on health and hygiene from their teachers and have access to WASH facilities are more likely to practice and adopt improved behaviors such as hand washing with soap after using the toilets (Marie-Claude Lang, 2012). In addition, teachers received training and were provided with relevant educational materials on hygiene promotion to be good role models. This in turn resulted in children being the motivators of improved behavior change in their communities.

In Kenya, studies conducted on the role of teachers in promoting children's WASH practices revealed that ECD teachers are resourceful in health and hygiene promotion activities in schools. They take lead in imparting children with knowledge and are encouraged to conduct practical sessions that engage the children to increase their understanding on the importance

of WASH (DW Njomo, 2016). In order to ensure that highest priority is given to provide improved WASH services to all schools, teachers should be well facilitated and equipped with adequate resources to deliver participatory WASH learning approaches. This will ultimately promote improved and sustainable WASH behaviors and services in schools (WHO, 2019).

### **2.3 Water, Sanitation and Hygiene Facilities and Practices in Schools**

Schools are considered to have improved services if they are able to provide reliable and safe water, facilities that promote hand hygiene and adequate sanitation facilities for both teachers and students that meet the required standards and hand-washing facilities that are strategically located to promote handwashing. In addition, the facilities should cater for all children including those with disabilities.

#### **2.3.1 Sources of water, storage facilities and water treatment practices**

Globally, 69% of schools have improved drinking water sources that provide basic services to the school population. While only 12% of schools have an improved source but providing limited service due to irregular supply of water. The remaining 19% of schools worldwide rely either on unimproved sources, or on no facilities at all (JMP, 2018). In Africa, only half of the schools have adequate water sources (UNICEF, 2012). While in Kenya, only 75% of the ECD schools have improved water sources however, the facilities are often poorly maintained with irregular supply of drinking water (JMP, 2018). Studies have indicated that drinking water from a protected water source can reduce the risk of diarrhea by 73% when treated directly at the source (WHO, 2014a) as compared to 28% reduction at point of use (WHO, 2014a). Water sources are categorized as either improved or unimproved water sources. The improved water sources are well protected and are able to adequately prevent any contamination (WHO, 2015).

Schools are required to have adequate water facilities that can be easily accessed and used for drinking and personal hygiene (WHO, 2009). The water points should be reliable and accessible to staff and school children, including those with disabilities, at all times. In addition, the water points should be designed to cater for the needs of pupils of various ages. Issues such as height will determine use hence should be factored in and water points appropriately constructed to facilitate use. According to the WHO, schools are required provide water for drinking and handwashing. Each student should have 5 liters of water per day for these services (WHO, 2009). In addition, to ensure safety, the water should be

disinfected and have free residual chlorine as per the WHO standards (WHO, 2011). Globally, studies have shown that simplified chlorinators or use of water treatment chemicals improves on the drinking water portability standards (Ribeiro, 2018). Other disinfection methods such as filtration, sedimentation and solar disinfection can be used in schools that have unimproved water sources to improve on the quality (WHO, 2002). To maintain the safe standards of drinking water, the public health officers are required to conduct regular monitoring of the water quality (WHO, 1997a). Schools are therefore required to have adequate WASH facilities and services to provide an enabling environment that enhances the children's ability to concentrate, thereby contributing to their overall health and development (Masento, 2014).

### **2.3.2 Types, conditions and use of sanitation facilities**

Globally, 66% of schools have sanitation facilities that are gender segregated and in good condition, while 12% of schools have facilities that are not segregated by gender and often in poor condition for use. Subsequently, the remaining 23% mostly from sub-Saharan Africa and Asia, lack improved sanitation facilities (JMP, 2018). In South America, studies conducted indicated that the schools have insufficient sanitation facilities that are poor condition. This has had an impact on the children especially the girls as the facilities do not offer privacy and hygiene which are crucial for menstrual hygiene management (Coswosk, 2019).

In sub-Saharan Africa, studies conducted in Amhara, Ethiopia indicated that schools in the region have low sanitation coverage with a latrine to pupil ratio of 1:64 (Hassen Seid, 2013). While in South Africa, a survey on school WASH practices indicated that most schools in the rural areas have inadequate sanitation facilities and are in poor condition for use with majority using pit latrines (Jerry, 2013). In Kenya, 100% of the schools have limited service on sanitation facilities since despite having improved sanitation infrastructure, the toilets are not gender segregated and are in poor condition for use (JMP, 2018). A study conducted in Kakamega Sub County, in Kenya showed that the sanitary facilities in schools within the region were in poor condition and in almost 50% of the schools, the facilities did not meet the required public health standards. This indicated low investment and priority in development of school WASH infrastructure and operation and maintenance of the facilities. (Faiza, 2015). The Government of Kenya recommends that schools should provide adequate facilities for school children that are child friendly and gender sensitive (WHO, 2009). In addition, there should be a special needs toilet for each gender to cater for the physically challenged pupils

and adequate toilets for the teaching staff. The school toilets should be properly designed to limit disease transmission. The floors should be smooth, squat holes should have a keyhole shape and the size of the squat holes taken into consideration to cater for young children (Zomerplaag, 2005). If sanitation facilities are not properly maintained and used, they can increase exposure to pathogens (Majra, 2010). Schools are required to have sufficient toilets that are accessible to all, including staff. The distance should be not more than 30 m from all users to minimize odours and avoid contamination of water sources. In addition, the facilities should be gender segregated and provide privacy. In ECD schools, the age and height of the children should be put into consideration when designing the toilet facilities. The school should ensure that the facilities are properly maintained and clean with handwashing facilities strategically situated next to the sanitation facilities (Zomerplaag & Mooijman, 2005).

### **2.3.3 Hand washing Facilities and practices in Schools**

Globally, 19% of people worldwide are estimated to practice handwashing with soap after visiting the toilet, with the practice more prevalent in developed countries as compared to Low middle income countries (WHO, 2014). The situation is similar in schools, with 36% of the schools worldwide lacking hygiene services with no defined stations or facilities for handwashing with soap. In developing countries, promotion of handwashing with soap in schools is done by placing footprints indicating direction to the handwashing facility from the toilets. This has made significant progress in the uptake of the practice. (Dreibelbis, 2016). Other studies have demonstrated that diarrheal incidences among children in ECD centers can be reduced by one-third through improved hand hygiene (Ejemot-nwadiaro,2015). This is as a result of improved the hygiene practices among school children following health and hygiene interventions that included proper hand hygiene at critical times (Rosen, 2006).

In Kenya, a hygiene promotion intervention impact study was conducted in rural Kenyan primary schools. The results indicated that availability of functional handwashing facilities in schools coupled with health and hygiene education trainings for both pupils and teachers improved knowledge and handwashing hygiene practices thereby reducing the risk of Acute Respiratory Infections (Minal, 2012). Handwashing with soap has been proven to contribute to the decrease in the number of diarrheal cases especially for children who are five years of age and below (Freeman, 2014). Schools are required to provide water for handwashing with soap located next to the toilet facilities, the kitchen and eating areas. They facilities should be constructed at an appropriate height that is convenient to promote accessibility at all times (Zomerplaag, 2005).



## **2.4 Promoting Sustainable access to Water, Sanitation and Hygiene in Schools**

Globally, despite efforts to increase access to water, sanitation and hygiene in schools' barriers exist in promoting sustained access to WASH services in these institutions. Majority of the schools worldwide lack adequate WASH infrastructure and services (Shannon, 2017). This is mainly due to inadequate financial resources to put in place improved WASH infrastructure, while at the same time promote complementary activities such as hygiene promotion and sensitization sessions and operation and maintenance of WASH infrastructure. In order to improve on the sustainability of School WASH interventions globally, there is need to include detailed programmatic and activity costs as well as lessons learnt in promoting sustainable WASH in schools (Schlegelmich,2016). Providing schools with budgets for operation and maintenance can improve access to supplies, however, in order to enhance sustainability, continuous health education on improved WASH practices should be included in school WASH plans and budgets allocated to support the interventions (Alexander, 2013).

Schools that encourage active participation and involvement of teachers and children in promoting access to improved WASH practices and services are beacons of hygiene promotion in the communities they serve (Melariri,2019). Integrating WASH in schools by providing simple enabling infrastructure coupled with health education on the importance of improved WASH practices contributes to life-long positive habits in children (Dubik, 2018). In developing countries, majority of the schools do not have sustainable access to water and sanitation facilities and services (Christie Chatterley, 2013), the school management committee plays a role in advocating for the provision of WASH facilities to cater for the children especially in ECD schools. The participation of the school parents' committee in WASH can influence resource prioritization on WASH thereby influencing children's WASH behaviors. Whereas in schools where the water, sanitation and hygiene facilities exist, adequate operation and maintenance carried out by teachers and pupils enhance increased service provision (Zomerplaag, 2005). Despite the development of guidelines and standards on the facility designs and requirements in majority of the countries, most schools do not have facilities that cater for the physically challenged hence hindering equitable access to WASH in schools (Mooijman, 2002). Interregional disparities also exist with most schools in the rural areas having poor WASH facilities in comparison to those in urban settings (JMP, 2018). A study conducted in Nicaragua indicated that WASH coverage in low-income rural

areas was minimal with only 43% of the schools having drinking water infrastructure, 64% access to sanitation and 81% were lacking handwashing stations (Tania, 2015).

In Kenya, the County Early Childhood Education Bill stipulates that all ECD schools should provide a conducive environment that promotes the holistic growth of this vulnerable populace. The teachers who are the caregivers at school should be equipped with skills and knowledge on WASH so as to promote a healthy learning environment. Teachers who conduct lessons on WASH themes find it interesting for the students, as it can be fun and lead to out of classroom activities such as clubs (Melariri, 2019).

## **2.5 Theoretical Framework**

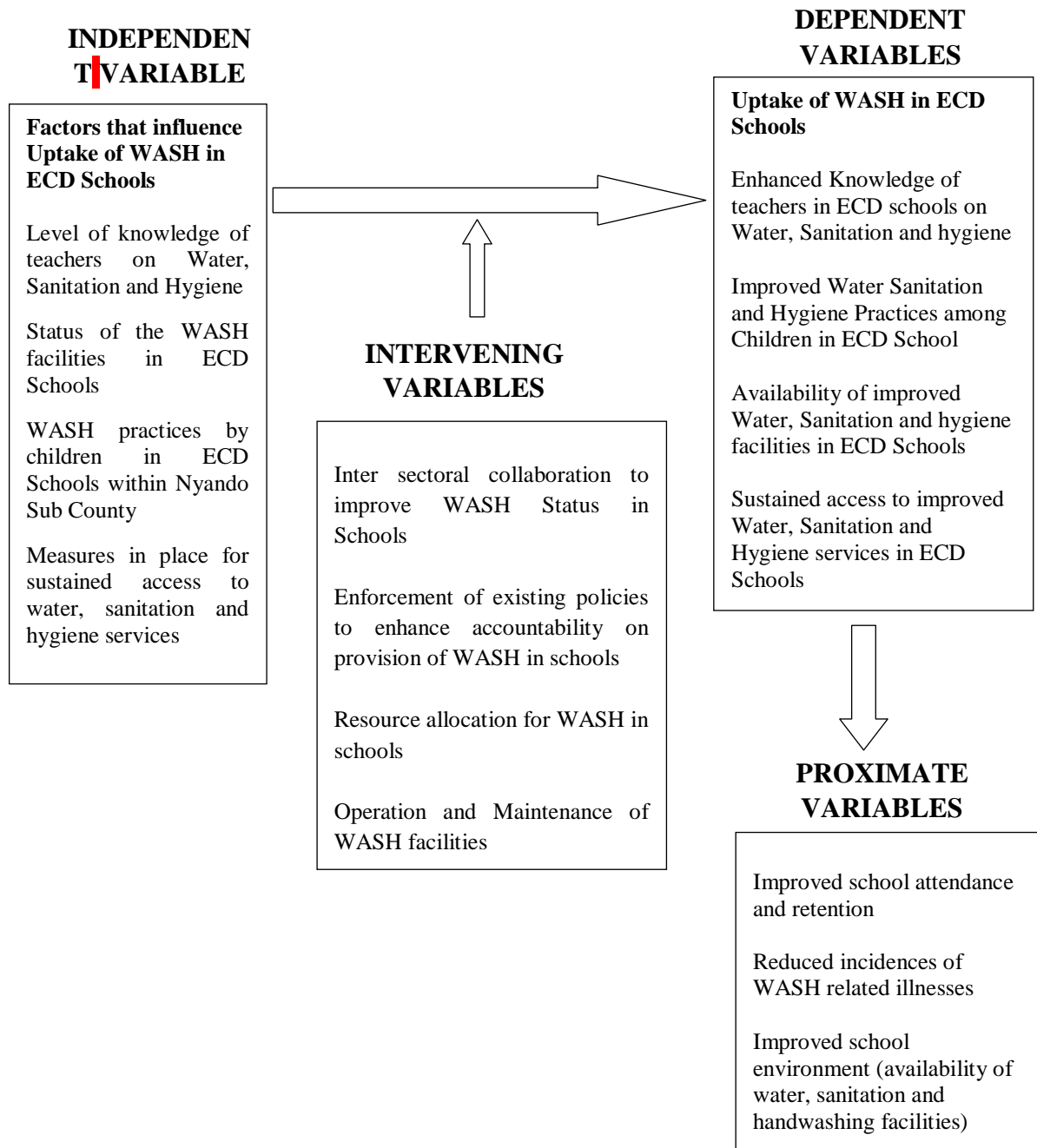
This study is guided by the social cognitive learning theory that postulates that an individual's behavior is directly related to one's environment and social interaction (Muro & Jeffrey 2008). It describes how the behavior of an individual can be determined by their close association with others in an environment that supports the adoption of the desired behaviors. The theory provides a platform for exposing individuals to gain information through observation and allows one to conceptualize the desirable behavior and understand the gains of adopting the practices being promoted majorly focusing on cognitive concepts and social experiences (Green & Peil, 2009). The individual observes, pays attention to the desired behavior, then imitates the practices or skills learnt and finally, based on positive reward, retains the good behavior. The theory provides opportunities for social support by using observational learning experiences and positive reinforcements to achieve behavior change

In WASH, behavior change among children is directed towards the particular goal of improved health. These improved WASH behaviors eventually become self-regulated. Social cognitive theory includes processes whereby individuals acquire their societal behaviors and practices through observation. In this case, the teachers in school and the WASH environment determine the WASH practices of children in ECD schools. The teachers are the role models and the children practice what they observe from these models.

This study therefore investigated and analyzed the factors influencing uptake of water, sanitation and hygiene practices among children in ECD schools which is in line with the above health promotion theory in order to attempt an explanation on adoption of improved water, sanitation and hygiene practices among children in ECD schools.

## **2.6 Conceptual Framework**

The conceptual framework below shows the interaction between the independent variables, dependent variables, intervening variables and proximate variables. The independent variables for this study are; the level of knowledge of teachers on Water, Sanitation and Hygiene, status of the WASH facilities in ECD Schools, WASH practices of children in ECD Schools within Nyando Sub County and the measures in place for sustained access to water, sanitation and hygiene services in ECD schools. The dependent variables are; enhanced knowledge of teachers in ECD schools on water, sanitation and hygiene, improved water sanitation and hygiene practices among Children in ECD Schools, availability of improved Water, Sanitation and hygiene facilities in ECD schools and sustained access to improved Water, Sanitation and Hygiene services in ECD Schools. The intervening variables are; inter sectoral collaboration to improve WASH status in schools, enforcement of existing policies to enhance accountability on provision of WASH in schools, resource allocation for WASH in schools and operation and maintenance of WASH facilities. The proximate variables are; improved school attendance and retention, reduced incidences of WASH related illnesses and improved school environment (availability of water, sanitation and handwashing facilities



**Figure 2.1: Conceptual Framework**

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the research materials and methods that were applied in the study. The key sections include study area, study design, study population, sample size determination, sampling techniques, data collection methods, data collection instruments, research procedure, quality control, piloting, validity of instrument, reliability of instrument, data analysis and ethical considerations.

#### **3.2 Study Area**

Nyando Sub-County where the study was conducted lies on River Nyando basin with a geographical area of 1,168.4 square kilometers (appendix 1). The study area has a population of 395,767 (Kisumu County Fiscal Paper) and lies 0° 25' South, with the lowest altitude of 1,100 m and high of 1,801m above the sea level. It's divided into two main administrative divisions namely Kadibo and Nyando with a total of 52,448 households. This area is basically an agricultural economy with sugarcane and rice being the main cash crops. (Mungai, 2004). Low sanitation coverage is a major challenge in schools especially primary and early Childhood Development Centers within the region. Most of the latrines in these institutions are dilapidated and in poor state of repair. Coverage for primary school sanitation facilities in functional condition is 85.83% due to of lack of maintenance. A School WASH analysis conducted by SANA/UNICEF in 2016 established the latrine ratio for girls in Kisumu County was 1:67 against the recommended ratio of 1:25 while the latrine ratio for boys was 1:73 against the recommended ratio of 1:30.

There are a total of 216 ECD schools in Nyando distributed across 4 Educational zones which are Nyangande, Awasi, rabuor and Ahero. Out of the 216 schools, 106 are public and 110 are private. (Kisumu County director of Education, 2020). The enrollment rate in ECD schools as reported by the Kisumu County director of education was 14,933 as at January 2019. ECD Teacher population as reported by the Nyando Sub County ECD Coordinator in January 2021 was 489

#### **3.3 Research Design**

This study adopted a cross-sectional survey design. This design was best suited for this study as it provided a description of the sample population showing the factors influencing uptake of WASH among the target population in Nyando sub county. The design allowed for

extensive data collection within a short period of time on issues based on the variables of study.

### **3.4 Study Population**

The study population were all the 489 teachers and 14,933 Children in public and private ECD schools within Nyando Sub County. The 489 teachers are the target population given the age of pupils in ECD schools.

#### **3.4.1 Target Population**

The study target population were 489 teachers and 14,933 children in 216 ECD schools within Nyando Sub County

##### **3.4.1.1 Inclusion Criteria**

- i. Teachers in ECD schools in Nyando sub county who were willing to participate in the study.
- ii. Children enrolled in ECD schools in Nyando sub county where the study was conducted.

##### **3.4.1.2 Exclusion Criteria**

- i. Teachers who were recruited less than 1 month in the ECD schools in Nyando sub county during the study period.
- ii. Teachers and children who were absent during the study period.

### **3.5 Sampling Design**

#### **3.5.1 Sample size determination**

Sample size determination was calculated to determine the number of participating schools, teachers and children. The teachers are the proxy target population given the age of the children in ECD schools. To get a sample size with good precision, the following formulas were used which are suitable for cross-sectional studies.

For school selection, the sample size calculation for prevalence studies formula with finite population (Daniel WW, 1999) was used as follows:

$$n' = \frac{NZ^2P(1 - P)}{d^2(N - 1) + Z^2P(1 - P)}$$

**Where:**

$n'$ =Sample size with finite population correction,

$N$ = Number of ECD schools in Nyando Sub County

$Z$ = Z statistics for a level of confidence (The standard normal deviation at the required confidence level = 1.96)

$P$ = Expected prevalence (The proportion in the target population estimated to have the characteristics being measured. Since the proportion is unknown 50% will be used. Thus  $P=0.5$ )

$d$ = Level of Precision (error reduction) set at 6%. (Thus  $d= 0.06$ )

From the County Education office,

$N= 216$

**Hence,**

$$n = 119.607$$

$$= 119.607 + 11.96070111(\text{Add } 10\% \text{ adjustment})$$

$$n' = 132$$

Fisher's formula below was then used to calculate the sample size of ECD teachers to participate in the study

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

Where:

$n$ = sample size (where population is > than 10,000)

$Z$  is critical value for 95% confidence interval=1.96

$P$  is proportion of teachers with improved WASH knowledge = 50 %

$d$  is the level of precision= 5%

$$n = \frac{1.96^2 * 0.5(1 - 0.5)}{0.05^2}$$

$$n = 384 \text{ Teachers}$$

Since the teacher target population is < 10,000 then sample adjustment was done using the following formula.

$$S = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where:

S= the desired sample size for population < 10,000

n= the calculated sample size

N =the total ECD teacher population in Nyando sub county

Therefore:

$$S = \frac{384.16}{1 + \left(\frac{384.16}{489}\right)}$$

$$S = 214.61452513$$

$$S = 215$$

Sample size Calculation for Children to be observed was calculated using fisher's formula

$$n = \frac{Z^2 \times P(1-P)}{d^2}$$

Where: Z is critical value for 95% confidence interval=1.96

P is proportion of children with improved WASH practices = 50 %

d is the level of precision= 5%

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$n = 384 + 38(10\% \text{ adjustments})$$

$$n = 422$$

### 3.5.2 Sampling Procedure

Multistage sampling technique was used in the study. The 1<sup>st</sup> stage involved selection of schools to be included, the second stage involved selection of teachers and the third stage was the selection of children to participate in the study. In the 1<sup>st</sup> stage, a list of all ECD schools within Nyando Sub County was obtained from the Sub County Education Office. The list of schools was arranged in alphabetical order (creating the school sampling frame) and systematic random sampling technique was then used to select the schools. The initial inclusion was through simple random sample which was the 5<sup>th</sup> school. After that every subsequent 2<sup>nd</sup> school on the list was selected until the required sample size was reached. (The interval size was selected using the formula  $K=N/n$  Where K is the interval size, N is number of schools and n is the desired sample size). For the second stage, From the selected



schools in stage 1, using the school teacher register as reference, a list of all eligible teachers in each school was obtained, arranged in alphabetical order then numbered from the first name being number one on the list (creating the participant sampling frame), the initial inclusion was through simple random sample which was the 2<sup>nd</sup> teacher. After that every subsequent 2<sup>nd</sup> teacher on the list was selected until the required sample size was reached. (The interval size was selected using the formula  $K=N/n$  Where K is the interval size, N is number of teachers and n is the desired sample size) Lastly, in the third stage, from the selected schools in stage 1, the children's WASH practices were observed in reference to use of the drinking water facilities, sanitation facilities and handwashing. The children were randomly selected by selecting the 3<sup>rd</sup> student who came out during break time to use the WASH facilities, after which every subsequent 35<sup>th</sup> student using the WASH facilities was selected until the required sample size was reached. (The interval size was selected using the formula  $K=N/n$  Where K is the interval size, N is number of children in ECD schools in Nyando and n is the desired sample size)

Participants for the Key Informant interviews were purposively selected based on their roles in the management of the ECD schools, policy development, implementation, and resource mobilization. Key Informants were the County ECD director, Sub County ECD director, Zonal Coordinators and headteachers. A total of 12 Key informants were interviewed.

### **3.6 Data Collection**

#### **3.6.1 Data Collection Tools**

Data was gathered with the aid of a pre-tested questionnaire (appendix II), observation checklist and a Key Informant Interview guide (appendix III). To address objective 1, quantitative data was collected using the pre-tested questionnaire. The questionnaire consisted of four sections: section A: Demographic information, section B: sources of knowledge questions, section C: Dissemination of health and hygiene activities at schools, Section D: Knowledge towards Water, Sanitation and Hygiene questions (Water, Sanitation, Hygiene and Diseases). An Observation checklist was used to collect data on objective 2 and 3 on status of WASH facilities and Children's practices. 217 questionnaires were administered to 217 teachers to allow for a broader and in-depth assessment of their level of knowledge on WASH and its influence on the children's WASH practices. The observation checklist was used to collect quantitative data on the status of the water, sanitation and hygiene facilities in the 132 ECD schools and on the children's WASH practices. Structures whose hygienic and structural standards were studied in the proposed learning institutions

included the following; latrines, water facilities and handwashing facilities. The WASH practices among the 422 children observed and recorded were handwashing at critical times, use of sanitation facilities and use of drinking water containers. Qualitative data addressing objective 4 on the assessment of measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools was collected using key informant interview guides. Each of the study variables in objective 1, 2 and 3 were measured against improved WASH practices and services which are the standard measures of good WASH behaviors by WHO aimed at reducing WASH related infections.

### **3.6.2 Data Management**

All the questionnaires were pre-coded and numbered for easy reference. All the filled questionnaires were verified by the researcher for completeness, logical inconsistencies and other errors while still in the field. All the copies were filed sequentially according to numbers for secure storage awaiting entry into the computer using SPSS software. The researcher thereafter sorted the filled in questionnaires, coded them and entered the data into a computer. Subsequently, the information was backed up on a hard drive and on google cloud

### **3.6.3 Quality control**

To ensure accurateness and completeness in data collection, all data collection tools were printed in advance, research assistants were required to countercheck the tools prior to proceeding to the field. The study tools were reviewed and cleaning up done in the field to ensure all the required data was accurately captured before leaving the study sites. The research assistants conducted daily meetings to review and check the completion of data collection tools.

### **3.7 Piloting**

A pilot study of 10% sample was carried out at Obuon ECD centre in Kisumu east Sub County. This was done to pre-test the questionnaires effectiveness in terms of adequacy and appropriateness. It was also used to make corrections, clarifications and highlight omissions to improve the data collection tools in the preparation and data collection exercise

### **3.8 Validity of Instrument**

The research instruments were first drafted then reviewed by the supervisor. This was done to ensure that the interpretations made from the findings are accurate and will be meaningful to the users (Mugenda & Mugenda, 2003). The questionnaire was further pre-tested at Obuon

ECD centre in Kisumu east Sub County to check if the results reflected the variables under study. Upon pre-testing and analysis done using Stata, the Cronbach's alpha level was found to be 0.872

### **3.9 Reliability of Instruments**

In order to determine the degree to which the data collection instruments will yield consistent results, pilot testing of the tools was done at Obuon ECD centre in Kisumu East.

### **3.10 Data Analysis and Presentation**

#### **3.10.1 Quantitative data analysis**

Quantitative data analysis was carried out to address specific objectives 1, 2 and 3 on the level of knowledge of teachers in ECD schools on WASH and its influence on the children's WASH practices, the status of WASH facilities in the ECD schools and the Children's WASH practices. The pre-coded quantitative data collected using the questionnaire was entered into the computer, cleaned and analyzed using Stata. Descriptive analysis of the demographic characteristics of the respondents and school (age, education level, gender, school population) was done and the results presented using tables and graphs. Cross-tabulation amongst the dependent variables versus independent variables was done to obtain the prevalence rates. Data was then further explored using the chi-square test of association. The association was considered to be statistically significant if the  $p\text{-value} < 0.05$ .

#### **3.10.2 Qualitative data analysis**

Qualitative data analysis was done to address specific objective 4 on the measures put in place to ensure sustained access to water, sanitation and hygiene in ECD schools within Nyando Sub County. The qualitative data collected through the Key Informant Interviews was transcribed and the main themes identified. The analysis was done based on the emergence of themes across the different study objectives and involved comparisons, response convergence/divergence analysis.

#### **3.10.3 Data Presentation**

Data was presented in form of tables, graphs and charts. The report will be disseminated through meetings with Nyando Sub County and Kisumu County Education department, workshops and other relevant forums at the Sub County and county level. The final report will be published after approval by Maseno School of Graduate Studies

### **3.11 Delimitations and Limitations**

The study encountered a number of limitations. Data on the WASH related infections was generated from the DHIS2 portal. This data has not been segregated as either WASH related illnesses at household level or at ECD level. In addition, the study did not assess the factors that influence uptake of WASH among the children at household level and only focused on institutional level, ECD schools. The researcher also encountered challenges in retrieving the latest data from the sub county ECD team on current teacher population and schools as the sub county did not have an updated data base. Information on school and teacher population was received from the zonal sub county heads which was time consuming. In addition, locating schools selected in the study was not easy, this was solved by recruitment of native research assistants who understood the area and terrain. The study therefore assumed that all the information given by the respondents was a true reflection of the actual situation in the area.

### **3.12 Ethical Considerations**

The research was conducted after approval by Maseno University Ethical Review Committee (MUERC). Permission was sought from the Kisumu County Governor, Kisumu County Commissioner and Kisumu County Director of Education. An informed written consent was obtained from the study participants prior to the interviews. No names of respondents were indicated in the questionnaires and information obtained from the respondents was treated with utmost confidentiality. At all times the researcher upheld and respected the rights and dignity of the respondents. All respondents were sensitized on the importance of giving the correct and accurate information. The data collected was treated with confidentiality and access limited to authorized personnel only. The teachers who are the care givers of the children in school provided consent given the age of the pupils. The assent form was read out loud to pupils before the interviews began and were signed by the head teacher.

## **CHAPTER FOUR**

### **FINDINGS**

#### **4.1 Introduction**

This chapter presents the findings on the specific research questions which were to; determine the level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children's WASH practices in Nyando Sub County, examine the status of WASH facilities in the ECD schools, establish the WASH practices of children in the ECD schools and to assess the measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County. Data was collected as from 18<sup>th</sup> to 22<sup>nd</sup> January 2021. Response rate was at 100%.

#### **4.2 Level of knowledge of teachers in ECD schools on water, sanitation and hygiene and its influence on the children's wash practices in Nyando sub county.**

##### **4.2.1 Socio-demographic Characteristics of respondents**

A total of 217 teachers and 422 children participated in the study. Out of the 217 teachers interviewed, 206 (95 %) were female teachers and only 11(5%) were male. The findings on roles of teachers indicated that most the respondents 204(94%) were teachers, while 10 (5%) were head teachers and 3(1 %) were deputy head teachers. Majority of the teacher respondents 88(41%) were between the age category of 31-40, while 73(34%) were between the age of 41-50, 37 and 19 were within the age category of 20-30 and 51-60 respectively. 146(67.28%) of the teacher respondents were pre-primary 2 teachers, 43(19.82%) were pre-primary 1 teachers and only 12(12.9%) were play group teachers. The children who were observed were distributed as follows; 228 (54%) Pre-primary 1, 160 (38%) Pre-primary 2, 34 (8%) Playgroup. The findings above are indicated in table 4.1.

**Table 4.1: Distribution of respondents of Nyando Sub-County (Source: Author).**

<b>Role in school</b>	<b>Frequency</b>	<b>Percentages</b>
Head teacher	10	5%
Deputy head teacher	3	1%
Teacher	204	94%
<b>Total</b>	<b>217</b>	
<b>Gender</b>	<b>Frequency</b>	
Male	11	5%
Female	206	95%
<b>Total</b>	<b>217</b>	
<b>Age category</b>	<b>Frequency</b>	
20-30	37	17%
31-40	88	41%
41-50	73	34%
51-60	19	8%
<b>Total</b>	<b>217</b>	
<b>Grade/</b>	<b>Frequency</b>	
Preprimary 1	43	19.28%
Preprimary 2	146	67.28%
Play group	28	12.9%
<b>Total</b>	<b>217</b>	

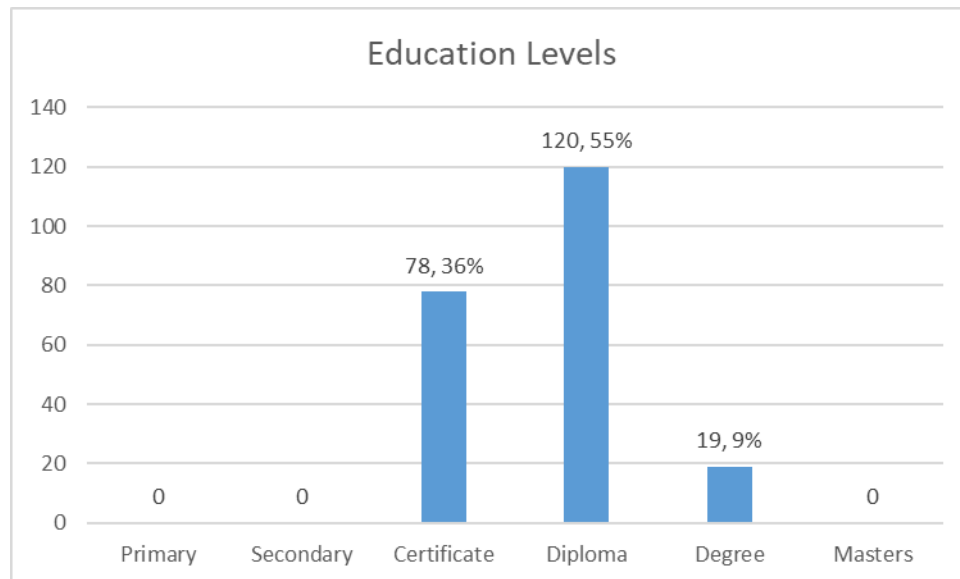
**Children WASH Practices observed**

	<b>Total Observation</b>	<b>%</b>
Preprimary 1	228	54
Preprimary 2	160	38
Play group	34	8
<b>Total</b>	<b>422</b>	<b>100</b>

**4.2.2 Education Level of teachers in ECD schools in Nyando**

Respondents were asked to state their highest educational qualification. From the results, 19 (36%) of respondents had attained University degrees, 120 (55%) had diploma education

while 78 (36%) had attained certificate education. The results were summarized in Figure 4.1 below.



**Figure 4.1: Education level of Respondents (Source: Author).**

#### **4.2.3 Source of knowledge on water, sanitation and hygiene**

##### **4.2.3.1 Ever received any training/information on safe water, sanitation and hygiene**

The findings indicate that majority of the participants 78 (69%) had received training/information on water, sanitation and hygiene, the findings were not statistically significant with the water uptake ( $p\text{-value}=0.247 > \text{critical value } (\alpha) = 0.05$ ). On the source of information, majority of the participants 45(40%), approved that they received the information since it was part of the curriculum, followed by those participants 33(29%) who received the training/information from public health officers. Nineteen (17%) respondents reported that they received the training from other sources and the least 4(4%) received the information either from the community, family or friends. There was no statistical significance between where the respondent's received information and the uptake of WASH practices among children in ECD schools in Nyando Sub County. The results are presented in table 4.2.

**Table 4.2: Training/ Information received among respondents of Nyando Sub-County**

<b>Training/Information on sanitation &amp; hygiene</b>	<b>Uptake of WASH Practices</b>		<b>Chi-Square &lt;0.05</b>
		<b>Frequency</b>	<b>P-Value</b>
<b>Received Training</b>			
Yes	78(69.03)	142(65.44)	0.247
No	35(30.97)	75(34.56)	
<b>PHO</b>		<b>Frequency</b>	<b>P-Value</b>
No	80(70.8)	156(71.89)	0.709
Yes	33(29.2)	61(28.11)	
<b>Part of school curriculum</b>		<b>Frequency</b>	<b>P-Value</b>
No	68(60.18)	128(58.99)	0.71
Yes	45(39.82)	89(41.01)	
<b>Community/ family/friends</b>		<b>Frequency</b>	<b>P-Value</b>
No	109(96.46)	206(94.93)	0.284
Yes	4(3.54)	11(5.07)	
<b>Other</b>		<b>Frequency</b>	<b>P-Value</b>
No	94(83.19)	186(85.71)	0.267
Yes	19(16.81)	31(14.29)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.2.3.2 Length of training/workshop on safe water sanitation and Hygiene

The findings revealed that majority 67(59.29%) of the participants were trained in less than 1 week, those who were trained in other different times were 38(33.63%). The participants who were trained for a period of 1 week and 2 weeks were 6(5.31%) and 2(1.77%) respectively. There was no participant that was trained for a period of 1 month, these findings are statistically insignificant with uptake of WASH practices among children in ECD schools in Nyando sub county (p-value=0.416 >critical value ( $\alpha$ ) =0.05). The results are summarized in table 4.3 below

**Table 4.3: Length of Training/ Workshop among respondents of Nyando Sub-County**

<b>Variable</b>	<b>Uptake of WASH Practices</b>		<b>Chi-Square</b>
		<b>Frequency</b>	<b>P-Value &lt;0.05</b>
<b>Time taken for training</b>			
Less than 1 week	67(59.29)	123(56.68)	0.416
1 week	6(5.31)	8(3.69)	
2 weeks	2(1.77)	4(1.84)	
1 month	0(0.00)	1(0.46)	
Other	38(33.63)	81(37.33)	
	<b>113(97.00)</b>	<b>217(100.00)</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools



#### 4.2.3.3 Teacher Training on WASH

The findings show that only 17 (8%) of the respondents agreed that the training was sufficient while 200 (92%) of the respondents indicated that the training was not sufficient. The results are shown in figure 4.2 below

Was the Training Sufficient?

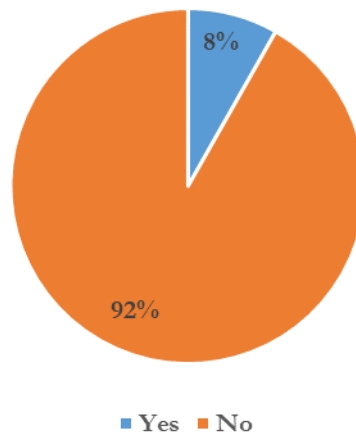
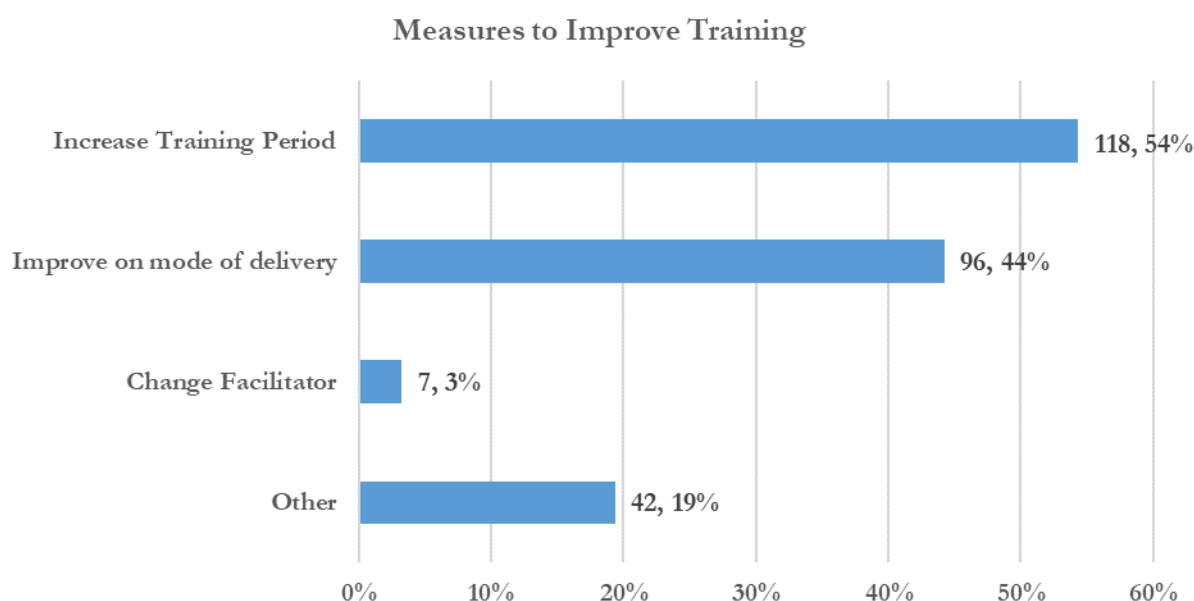


Figure 4.2: Was the Training sufficient (Source: Author).

#### 4.2.3.4 What can be done to improve on the training

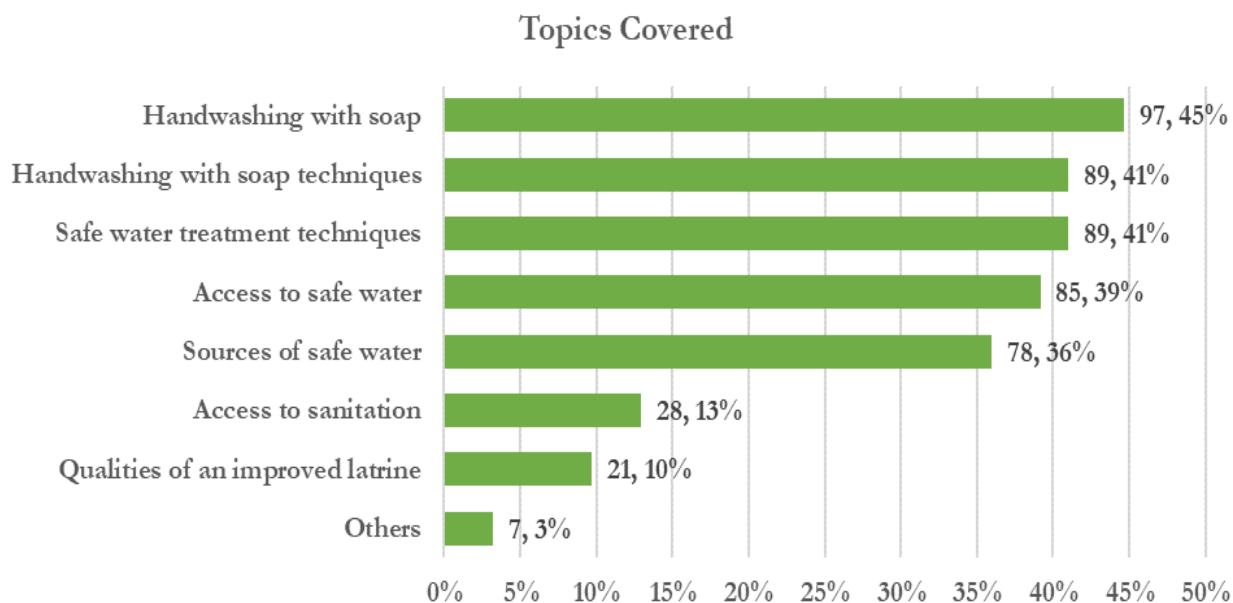
The respondents were asked what could be done to improve the trainings. Majority 118 (54.38%) of the respondents suggested that there should be an increased training period so as to improve on training, 96 (44.44%) of the respondents proposed that there should be an improvement on the mode of delivery, while 42 (19.44%) indicated other different ways to improve on the training such as through exchange visits. The minority 7(3.24%) of the respondents suggested that, the training facilitators should be changed to improve on the trainings. The results are presented in figure 4.3 below



**Figure 4. 3: What can be done to improve the Training (Source: Author).**

#### **4.2.3.5 Topics covered on safe water, sanitation and hygiene promotion**

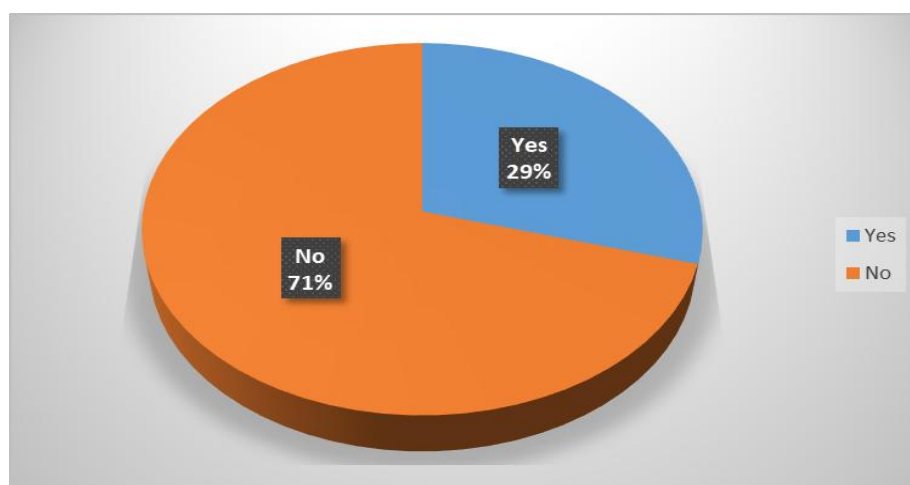
The findings indicate the topics that were covered on safe water, sanitation and hygiene promotion. On hygiene, 89 (44.7%) of the respondents revealed that they had covered a topic on hand washing with soap, while 89 (41.01%) of the respondents confirmed that they had covered a topic on handwashing with soap technique which included handwashing steps. on safe water treatment, 89 (41.2%) of the respondents indicated that they had covered a topic on safe water treatment techniques. Only 21(10%) of the respondents mentioned that had covered a topic on qualities of an improved latrine, and 3.24% of the respondents mentioned other different topics that they had covered. The resulted are presented in figure 4.4 below.



**Figure 4.4: Topics covered on safe water, sanitation and hygiene among respondents of Nyando Sub-County (Source: Author).**

#### 4.2.3.6 Refresher training/information/ courses received on safe water, sanitation and hygiene

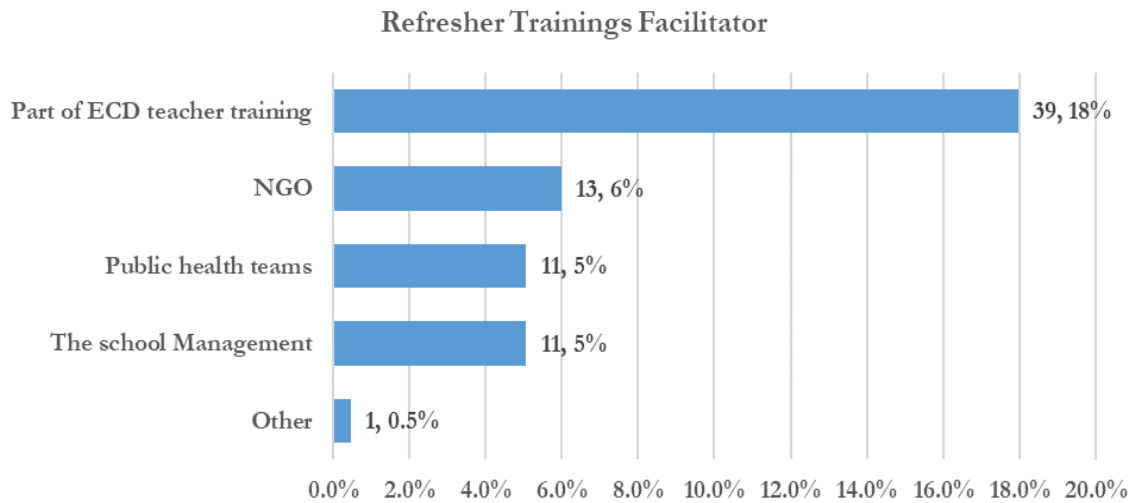
Close to a third, 63 (29%) of the respondents confirmed that they had received refresher trainings/information/ courses on safe water, sanitation and hygiene while 154 (71%) of the participants reported to not have received refresher trainings/information/ courses on safe water, sanitation and hygiene. The results are shown figure 4.5 below



**Figure 4.5: Refresher Trainings/ information/ courses received on Water, Sanitation and Hygiene (Source: Author).**

#### 4.2.3.7 Facilitator for refresher trainings

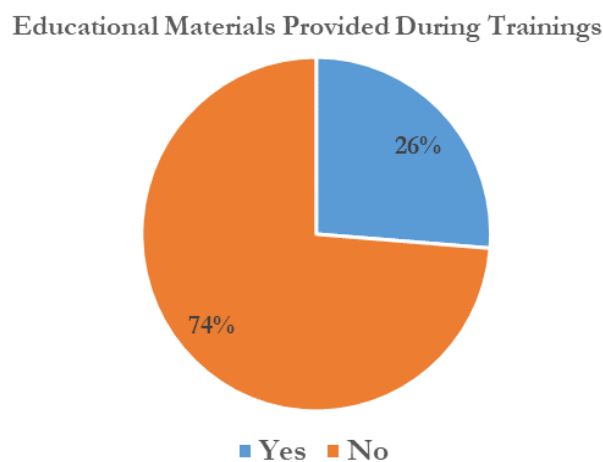
Majority of the respondents 39 (17.97%) received refresher trainings since it was part of the training as an ECD teacher. Thirteen (5.99%) respondents received the refresher training from NGO, while 11 (5.07%) of respondents were facilitated by the school management and the public health team and 1(0.46%) was trained by other facilitators. The results are presented in figure 4.6 below.



**Figure 4.6: Refresher Trainings Facilitators (Source: Author).**

#### 4.2.3.8 Educational materials provided

The findings shows that 56 (26%) of respondents approved that were provided with educational materials during trainings. The remaining 161 (74%) respondents did not receive any educational materials for reference. The results are indicated in figure 4.7 below.



**Figure 4.7: Educational Materials provided during trainings (Source: Author).**

#### 4.2.3.9 Importance of documents provided

Majority of the respondents who received educational materials 83(73.45%) affirmed that the educational document that they were provided with during the training, were not helpful when teaching the students about water, sanitation and hygiene. Twenty nine (25.66%) reported that the material they were provided with were very helpful and only 1(0.88%) indicated that the materials were not very helpful. The results are presented in table 4.4 below

**Table 4.4: How helpful were the documents provided (Source: Author).**

Document helpful	Uptake of WASH Practices		Chi-square P-value <0.05
	Frequency		
Very Helpful	29(25.66)	56(25.81)	0.63
Not very helpful	1(0.88)	1(0.46)	
Not helpful	83(73.45)	160(73.73)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.2.4 Level of knowledge of teachers on water and its influence on children's WASH Practices

##### 4.2.4.1 Knowledge on sources of water

The findings on the knowledge towards water sources, indicates 103(91.15%) of the participants had no knowledge on natural spring as source of water, majority of the participants 111(98.23%) had knowledge on lakes and rivers as the source of water and 101(89.38%) mentioned rain water as their main source of water. In addition, 98(86.73%) mentioned wells/ bore holes as sources of water and 17(17.04%) mentioned other different sources of water. Furthermore, wells/bore holes were highly significant with uptake of WASH among the children in ECD schools in Nyando sub-county, Kisumu (p-value=0.012 < critical value ( $\alpha$ ) =0.05). The results are indicated in table 4.5.

**Table 4.5: Knowledge towards Water (Sources of Water) (Source: Author).**

<b>Source of water</b>	<b>Uptake of WASH Practices</b>		<b>Chi-square &lt;0.05</b>
<b>Natural Springs</b>		<b>Frequency</b>	<b>P-Value</b>
No	103(91.15)	200	0.562
Yes	10(8.85)	17	
<b>Lakes and rivers</b>		<b>Frequency</b>	<b>P-Value</b>
No	2(1.77)	6(2.76)	0.351
Yes	111(98.23)	211(97.24)	
<b>Rainwater</b>		<b>Frequency</b>	<b>P-Value</b>
No	12(10.62)	28(12.9)	0.296
Yes	101(89.38)	189(87.1)	
<b>Wells/Boreholes</b>		<b>Frequency</b>	<b>P-Value</b>
No	15(13.27)	43	<b>0.012</b>
Yes	98(86.73)	174	
<b>Other</b>		<b>Frequency</b>	<b>P-Value</b>
No	96(84.96)	187	0.588
Yes	17(15.04)	30	
<b>Specify</b>		<b>Frequency</b>	<b>P-Value</b>
Missing	96(84.96)	187(86.18)	0.101
Dams	0(0.00)	3(1.38)	
Ponds	0(0.00)	1(0.46)	
Taps	17(15.04)	26(11.98)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### **4.2.4.2 Teachers knowledge on the importance of making water safe for drinking**

Findings on the importance of making water safe for drinking indicated that 89(78.76%) of the respondents reported that it was important to make drinking water safe so as to kill germs, 81(71.68%) of them suggested that it was important since it made water safe for drinking. Slightly more than a half, 64 (56.64%) respondents established that making water safe reduced the chances of getting diarrhea while 2(1.77%) suggested different reasons why drinking water should be made safe. There was no statistical significance between importance of making water safe and the uptake of WASH practices among children in ECD schools. The results are listed in table 4.6.

**Table 4.6: Importance of making water safe for drinking (Source: Author).**

<b>Importance of making water safe for drinking</b>	<b>Uptake of WASH Practices</b>	<b>Chi-square &lt;0.05</b>
<b>Kills germs</b>	<b>Frequency</b>	<b>P-Value</b>
No	24(21.24)	0.511
Yes	89(78.76)	
<b>Makes water safe to drink</b>	<b>Frequency</b>	<b>P-Value</b>
No	32(28.32)	0.474
Yes	81(71.68)	
<b>Reduces chances of getting diarrhea</b>	<b>Frequency</b>	<b>P-Value</b>
No	49(43.36)	0.305
Yes	64(56.64)	
<b>Gives water better taste</b>	<b>Frequency</b>	<b>P-Value</b>
No	111(98.23)	0.206
Yes	2(1.77)	
<b>Other</b>	<b>Frequency</b>	<b>P-Value</b>
No	111(98.23)	0.61
Yes	2(1.77)	
<b>Specify</b>	<b>Frequency</b>	<b>P-Value</b>
Missing	111(98.23)	0.511
Hygiene	1(0.88)	
Prevent diseases	1(0.88)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### **4.2.4.3 Teachers knowledge on safe water treatment techniques**

Majority of the participants 100 (88.5%) reported that they are aware of water treatment using water treatment chemicals like *water guard* as a technique of making water safe, 98 (97.12%) are familiar with the technique boiling water, while 15(13.27%) respondents have knowledge on sedimentation. Only 14(12.39%) of the respondents had knowledge on filtration as a safe water treatment technique. Among the safe water treatment techniques, teacher's knowledge on boiling water was statistically significant with the factors affecting water uptake, sanitation and hygiene among ECD children in schools in Nyando Sub County ( $p\text{-value}=0.006 < \text{critical value } (\alpha) =0.05$ ). The results are presented in table 4.7.

**Table 4.7: Safe Water Treatment Techniques (Source: Author).**

<b>Safe Water Treatment techniques</b>	<b>Uptake of WASH Practices</b>		<b>Chi-square &lt;0.05</b>
<b>Boiling</b>		<b>Frequency</b>	<b>P-Value</b>
No	15(13.27)	18(8.29)	0.006
Yes	98(97.12)	199(86.73)	
<b>Add water treatment</b>		<b>Frequency</b>	<b>P-Value</b>
No	13(11.5)	24(11.06)	0.828
Yes	100(88.5)	193(88.94)	
<b>Filtration</b>		<b>Frequency</b>	<b>P-Value</b>
No	99(87.61)	185(85.25)	0.307
Yes	14(12.39)	32(14.75)	
<b>Sedimentation</b>		<b>Frequency</b>	<b>P-Value</b>
No	98(86.73)	189(87.1)	0.865
Yes	15(13.27)	28(12.9)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### **4.2.5 Level of knowledge of teachers on sanitation and its influence on children’s WASH practices**

##### **4.2.5.1 Knowledge on disposal of human faeces**

Most 75 (66.37%) of the respondents reported that human feces are supposed to be disposed of in a proper way to avoid contamination of water supplies and soil. Fifty four (47.79%) of the respondents indicated that human faeces are also supposed to be disposed in a proper way since it contains germs. Thirty seven (32.74%) respondents agreed that human feces should be disposed properly to avoid smell. Teachers knowledge on proper disposal of human feces was highly significant ( $p\text{-value}=0.026 < \text{critical value } (\alpha) =0.05$ ) with the uptake of WASH practices among ECD children in Nyando sub-county schools. The results are presented in table 4.8 below.

**Table 4.8: Knowledge towards Sanitation (Disposal of Human Faeces) (Source: Author).**

<b>Importance of disposal of human faeces</b>	<b>Uptake of WASH Practices</b>		<b>Chi-square &lt;0.05</b>
<b>Contain germs hence should be disposed off</b>		<b>Frequency</b>	<b>P-value</b>
No	59(52.21)	121(55.76)	0.273
Yes	54(47.79)	96(44.24)	
<b>Avoids Contaminating water &amp; soils</b>		<b>Frequency</b>	<b>P-value</b>
No	38(33.63)	59(27.19)	0.026
Yes	75(66.37)	158(72.81)	
<b>Smell purposes</b>		<b>Frequency</b>	<b>P-value</b>
No	76(67.26)	149(68.66)	0.641
Yes	37(32.74)	68(31.34)	
	32.74	31.34	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools



#### 4.2.5.2 Teachers knowledge on the importance of having and using a toilet

Most respondents 104(92.04%) indicated that it was important to have and use a toilet for health purposes while 43(38.05%) respondents reported that it was important to have and use a toilet for smell prevention purposes. Twenty-three 23(20.35%) of the respondents indicated that it was important to have a toilet as it was a good thing. Seventeen (15.04%) respondents revealed that it is important to use a toilet for status/ recognition by family/community. Moreover, teachers knowledge on the importance of using a toilet with regards to smell purposes was statistically significant ( $p\text{-value}=0.001 < \text{critical value } (\alpha) =0.05$ ) with WASH uptake among children in ECD schools in Nyando sub-county. The results are presented in table 4.9 below

**Table 4.9: Knowledge towards Sanitation (Importance of having a toilet)**

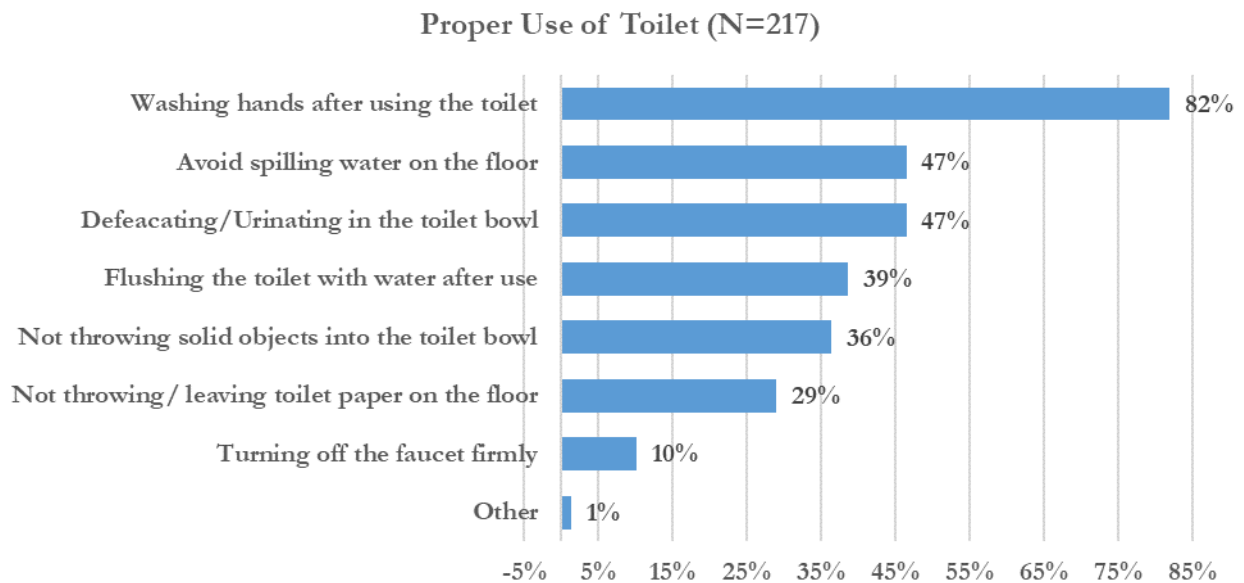
<b>Importance of having a toilet</b>	<b>Uptake of WASH practices</b>		<b>Chi-square&lt;0.05</b>
		<b>Frequency</b>	<b>P-value</b>
Health Purpose			
No	9(7.96)	25(11.52)	0.087
Yes	104(92.04)	192(88.48)	
Smell Purpose			
No	70(61.95)	110(50.69)	0.001
Yes	43(38.05)	107(49.31)	
Status in family/community			
No	96(84.96)	179(82.49)	0.319
Yes	17(15.04)	38(17.51)	
It is good to use a toilet			
No	90(79.65)	174(80.18)	0.836
Yes	23(20.35)	43(19.82)	
Other			
No	107(94.69)	206(94.93)	0.866
Yes	6(5.31)	11(5.07)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.2.5.3 Teachers knowledge on proper toilet use

On proper toilet usage, 178 (82.03%) respondents reported that washing hands after using the toilet is good practice on toilet use. 101(46.54%) of the respondent considered defecating/urinating in the toilet bowl as not a good practice. 84 (38.71%) indicated that flushing the toilet with water after use is proper toilet use, 79 (36.41%) of the respondents revealed that not throwing solid objects in the toilet is considered as proper toilet use and 63 (29.03%) considered not throwing and leaving toilet paper on the floor as good toilet use.

Other good indicators on proper toilet use were turning off the faucet firmly and not leaving it open. The results are indicated in figure 4.8 below.

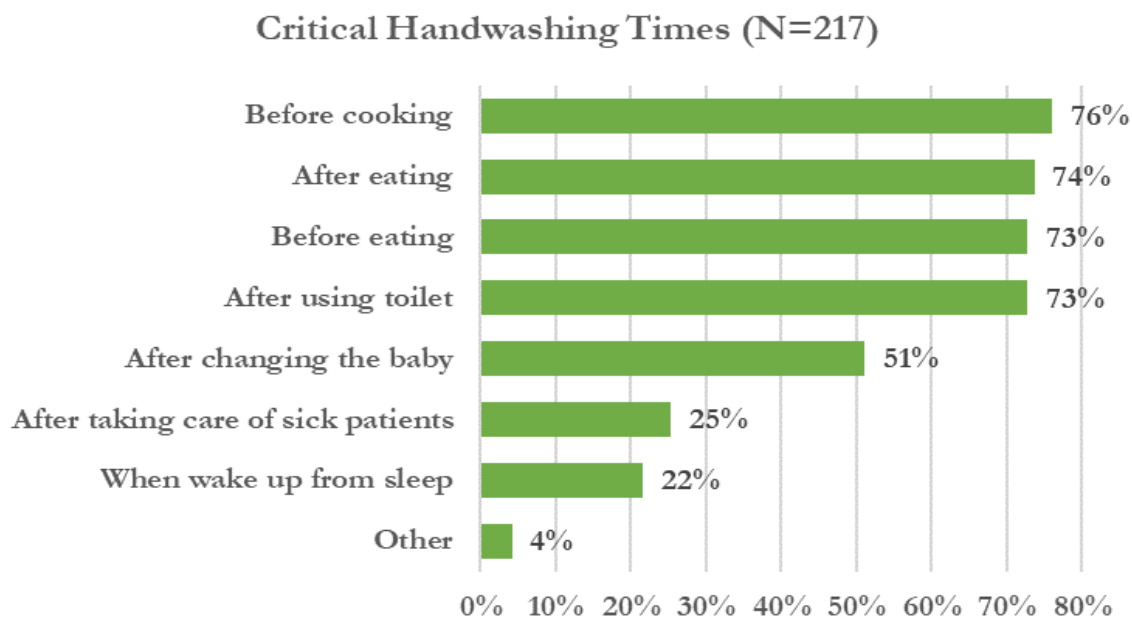


**Figure 4.8: Knowledge towards Sanitation (Proper Toilet Use) (Source: Author).**

#### **4.2.6 Level of knowledge of teachers on hand washing practices and its influence on Children’s WASH practices**

##### **4.2.6.1 Teachers knowledge on critical times to wash your hands**

The findings on the knowledge towards hand washing practices showed that 165 (76.04%) of the respondents established that the critical times to wash hands was before cooking, 159 (73.73%) suggested that the critical times to wash hands was after eating while 158 (72.81%) indicated that it was critical to wash hands after using the toilet and before eating respectively. One hundred and eleven (51.15%) participants revealed that the critical times to wash hands was after changing the baby, while 56 (25.6%) said that it was critical to wash hands after taking care of sick patients. Only 47 (21.76%) participants indicated that it was critical to wash hands after waking up. The findings are summarized in figure 4.9 below.



**Figure 4.9: Knowledge towards Hand washing practices (Critical times to wash hands)**  
(Source: Author)

#### **4.2.6.2 Knowledge of teachers on the importance of washing hands using water and soap**

The respondents were asked to mention the importance of washing hands with soap. Majority, 90 (79.65%) of them mentioned that the importance of washing hands using water and soap was to reduce the chances of getting diarrhea. About 58 (51.33%) responded that keeping hands clean was one of the reasons why people wash hands using water and soap. Ninety eight (87.5%) indicated that washing hands using water and soap reduces the chances of having disease infections and stomach aches, 6(5.36%) mentioned other different reasons why it was important wash your hands using water and soap. The findings are presented in table 4.10.

**Table 4.10: Knowledge towards Hand washing practices (Importance of washing hands using soap and water)**

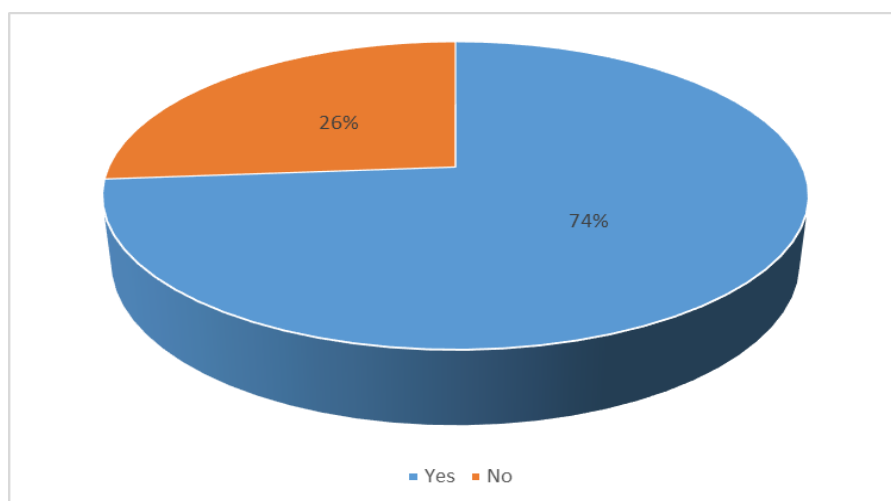
Importance of washing hands with soap and water	Uptake of WASH practices		Chi-square <0.05
<b>Reduces diarrhea</b>		<b>Frequency</b>	<b>P-Value</b>
No	23(20.35)	43(19.82)	0.836
Yes	90(79.65)	174(80.18)	
<b>Keeps hands clean</b>		<b>Frequency</b>	<b>P-Value</b>
No	55(48.67)	102(47)	0.608
Yes	58(51.33)	115(53)	
<b>Reduces stomach aches</b>		<b>Frequency</b>	<b>P-Value</b>
No	98(87.5)	189(87.91)	0.849
Yes	14(12.5)	26(12.09)	
<b>Religious beliefs</b>		<b>Frequency</b>	<b>P-Value</b>
No	112(100)	212(98.6)	0.069
Yes	0(0.00)	3(1.4)	
<b>Other</b>		<b>Frequency</b>	<b>P-Value</b>
No	106(94.64)	206(95.37)	0.597
Yes	6(5.36)	10(4.63)	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.2.7 Level of knowledge of teachers on faecal oral diseases and its influence on children’s WASH practices

##### 4.2.7.1 Knowledge of teachers on faecal-oral disease transmission

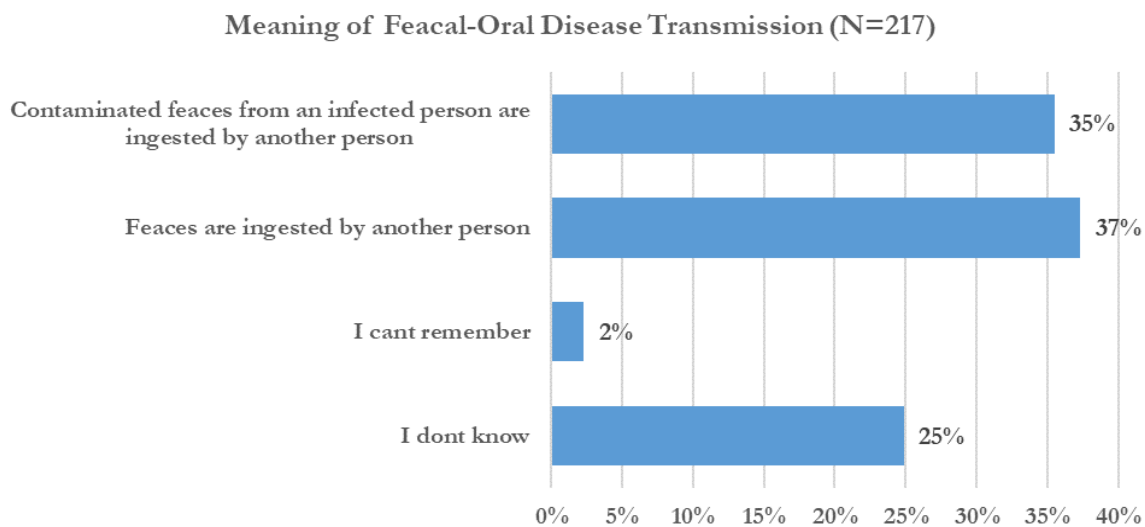
The results in this study reveals that only 56 (26%) of the respondents had no knowledge about faecal-oral disease transmission and 161 (74%) of the respondents had knowledge about faecal-oral disease transmission. The findings are presented in figure 4.10 below.



**Figure 4.10: Knowledge towards Diseases (Knowledge on faecal oral diseases) (Source: Author).**

#### 4.2.7.2 Knowledge of teachers on faecal-oral transmission disease

The respondents were requested to describe the meaning of faecal oral diseases. Slightly more than a third 81 (37.33%) of the respondents suggested that it was meant ingestion of faeces by another person. Seventy eight (35.48%) respondents indicated the meaning of faecal oral transmission disease is the ingestion of contaminated faeces from an infected person by another person, 54 (24.88%) respondents did not know the meaning of faecal-oral transmission disease and lastly, 5 (2.3%) of respondents could not remember the meaning of faecal-oral transmission disease. The findings are presented in figure 4.11 below.



**Figure 4.11: Knowledge towards Diseases (Meaning of faecal oral disease transmission)**  
(Source: Author).

### 4.3 The status of the wash facilities in ECD schools in Nyando Sub- County

#### 4.3.1 The status of drinking water facilities in ECD schools in Nyando sub-county

The status of WASH facilities was observed in the schools. Majority of the schools 82 (72.57%) had a drinking water source available. The drinking water sources were protected as observed in 81 (71.68%) schools. The findings indicated that there was a tap in 75 (66.37%) schools. Water flowed out of the tap in 58 (51.33%) of the schools. The taps did not have any leakage as observed in 61 (53.98%) of the schools. There was a drinking water storage container as observed in 82 (72.57%) schools. The cup/ladle/dipper had been kept clean, off the floor and out of reach of students as observed in 78 (69.03%) schools. The findings also established that the drinking water storage container was covered in 75 (66.37%) schools and the storage container looked clean in 83 (73.45%) schools. The drinking water storage container did not have a narrow neck as observed in 83 (73.45%) schools.

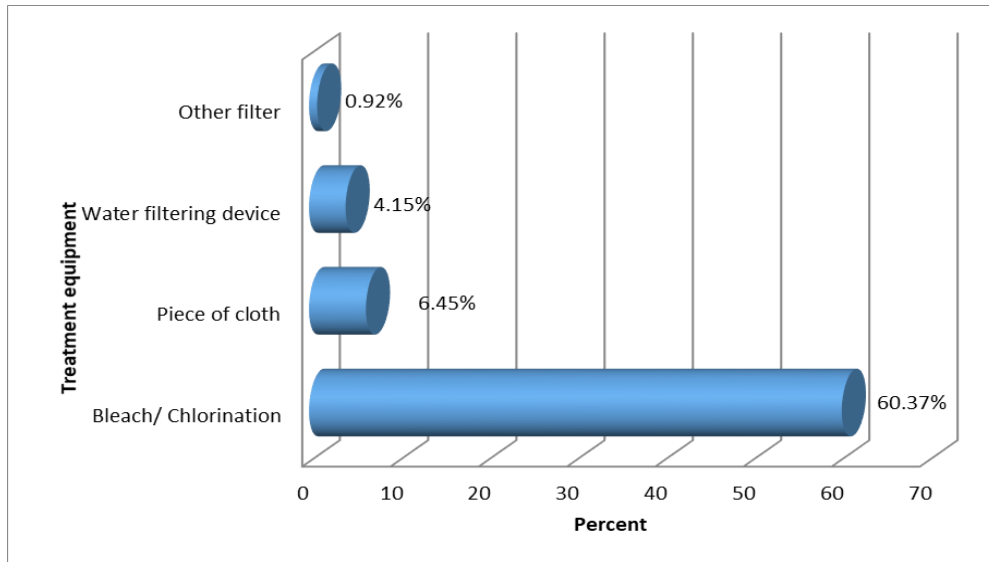
schools. The chi-square test of association on the availability of WASH facilities in schools indicated that the presence of a functional drinking water source (p-value=0.008< critical value ( $\alpha$ ) =0.05) and the proper storage of water (covering of the water storage container) (p-value=0.022< critical value ( $\alpha$ ) =0.05) had a significant effect on the uptake of water, sanitation and hygiene practices among children in ECD schools in Nyando Sub County, Kisumu County, Kenya. The findings are listed in table 4.11 below.

**Table 4.11: Status of WASH Facilities- Access to water (Source: Author). Access to water**

<b>Variable</b>	<b>Uptake of WASH practices</b>	<b>Frequency</b>	<b>Chi-square &lt;0.05</b>
<b>Drinking water source</b>			
Yes	82 (72.57)	167 (76.96)	<b>0.008</b>
No	16(14.16)	33 (15.21)	
Missing	15 (13.27)	17 (7.83)	
<b>Drinking water source protection</b>			
Yes	81 (71.68)	165 (76.04)	0.271
No	11 (9.73)	19 (8.76)	
Missing	21 (18.58)	33 (15.21)	
<b>Tap availability</b>			
Yes	75 (66.37)	141 (64.98)	<b>0.015</b>
No	8 (7.08)	28 (12.9)	
Missing	30 (26.55)	48 (22.12)	
<b>Water flow in the tap</b>			
Yes	58 (51.33)	120 (55.3)	0.174
No	22 (19.47)	33 (15.21)	
Missing	33 (29.2)	64 (29.49)	
<b>Tap leakage</b>			
Yes	0 (0)	0 (0)	0.118
No	61 (53.98)	128 (58.99)	
Missing	52 (46.02)	89 (41.01)	
<b>Drinking water container</b>			
Yes	82 (72.57)	166 (76.96)	0.253
No	21 (18.58)	35 (16.13)	
Missing	10 (8.85)	15 (6.91)	
<b>Clean cup/ladle/dipper</b>			
Yes	78 (69.03)	159 (73.27)	0.338
No	12 (10.62)	20 (9.22)	
Missing	23 (20.35)	38 (17.51)	
<b>Storage container cover</b>			
Yes	75 (66.37)	159 (73.27)	<b>0.022</b>
No	10 (8.85)	12 (5.53)	
Missing	28 (24.78)	46 (21.2)	
<b>Clean storage container</b>			
Yes	83 (73.45)	167 (76.96)	0.405
No	2 (1.77)	4 (1.84)	
Missing	28 (24.78)	46 (21.2)	
<b>Narrow neck container</b>			
Yes	2 (1.77)	5 (2.3)	0.367
No	83 (73.45)	166 (76.5)	
Missing	28 (24.78)	46 (21.2)	
<b>Total</b>	<b>113</b>	<b>217 (100)</b>	

### 4.3.2 Treatment equipment

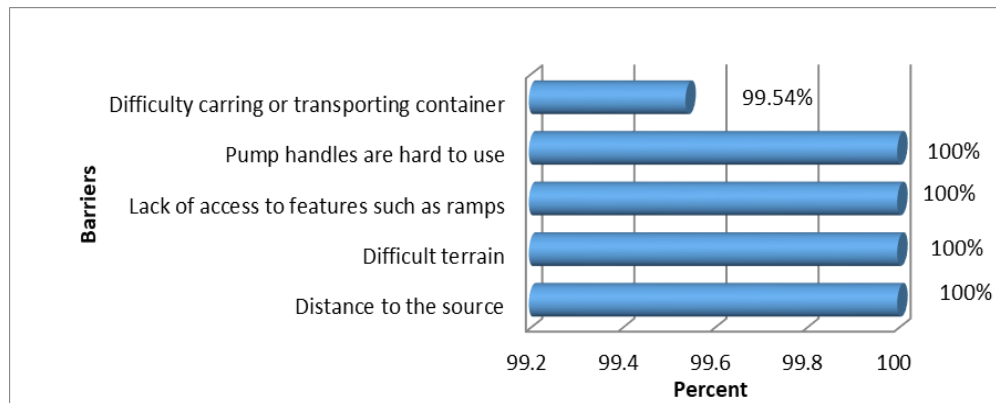
It was established that most, 130 (60.37%) of the schools used bleach/ chlorination to treat water while 14(6.45%) of them used a piece of cloth. It was further observed that 9 (4.15%) of the schools treated water using a filtering device and 2 (0.92%) schools used other filtering methods in treating water. The findings are presented in figure 4.12 below.



**Figure 4.12: Status of WASH Facilities (Treatment equipment) (Source: Author).**

### 4.3.3 Challenges faced by Children with a disability or special needs in getting drinking water without assistance

The results in the figure indicated that students with disability had no challenge with distance to the water source, terrain, pump handles, or features such as ramps. This was observed in all the 216 schools (100%). In 215 (99.54%) schools, it was observed that the disabled students had challenges in carrying or transporting containers. The findings are presented in figure 4.13 below.



**Figure 4.13: Status of WASH Facilities (disability barriers) (Source: Author).**

#### 4.3.4 Points of used water discharge

The largest proportion 94 (43.32%) of the schools disposed used water in premises yard or garden, 50 (23.04%) disposed water in an open channel, 35 (16.13%) in a sanitation facility, and 15 (6.91%) in a street surface. The findings are presented in table 4.12 below.

Table 4.12: Status of WASH Facilities (points of used water discharge)

Points of discharge of used water	Frequency (Percent)
Piped sewer	3 (1.38)
Piped, don't know where	0 (0)
Soak away/Cesspit/Septic system	0 (0)
Sanitation facility	35 (16.13)
Open channel	50 (23.04)
Street surface	15 (6.91)
Street ditch/gutter	2 (0.92)
Space outside premises	4 (1.84)
Water body (lake, river)	0 (0)
Premise's yard/garden	94 43.32)

#### 4.3.5 Other observations

Other observations were conducted on points of discharge of used water in the schools. There were signs of residues in the water discharge points in 115 (53.00%) schools. A smaller proportion of 35 (16.20%) schools had stagnant water pools, while in 2 (0.93%) schools, the water was discharged in swampy areas. The findings are listed in table 4.13 below.

Table 4.13: Status of WASH Facilities (points of used water discharge-other observations)

Observations in water discharge points	Frequency (Percent)
Stagnant water pool	35 (16.20)
Swampy area	2 (0.93)
Lots of insects/Mosquito breeding	0 (0)
Bad smell	1 (0.46)
Signs of residues	115 (53.00)
Others	1 (0.46)

#### 4.3.6 Sanitation facilities

There were 216 (100%) toilets observed in the schools. It was also observed that there were no flush toilets in all schools 0 (0%). On types of sanitation facilities, 212 (97.70%) were pit latrines with slabs while 93 (30.4%) were VIP latrines. The findings are presented in table 4.14.



**Table 4.14: Status of WASH Facilities (Access to sanitation)**

<b>Variable</b>	<b>Frequency (Percent)</b>
<b>School toilets</b>	
Yes	216 (100)
No	0 (0)
<b>Flush/Poor flush</b>	
Flush to piped sewer system	0 (0)
Flush to septic tank	0 (0)
Flush to pit latrine	0 (0)
Flush to somewhere else	0 (0)
<b>Pit latrine</b>	
Pit latrine without slab	0 (0)
Ventilated Pit Latrine	93 (42.86)
Pit latrine with slab	212 (97.70)
Composting toilet	0 (0)
Bucket	0 (0)
Hanging toilet/ Latrine	0 (0)
No facility/ Bush/ Field	0 (0)

**4.3.6.1 Condition of the sanitation facilities**

The findings indicated that 85 (75.22%) of the sanitation facilities observed were fully functioning and 28 (24.78%) were partially functioning. The association between the condition of the sanitation facilities and uptake of WASH practices among children in ECD had a significant relationship ( $p\text{-value}=0.0112 < \text{critical value } (\alpha) =0.05$ ). Majority, 85 (75.22%) of the toilets/ latrines observed provided privacy. The findings are presented in table 4.15 below.

**Table 4.15: Status of WASH Facilities (Access to sanitation-condition of toilets)**

<b>Variable</b>	<b>Uptake of WASH Services</b>	<b>Frequency</b>	<b>Chi-square &lt;0.05</b>
<b>Conditions of sanitation facilities</b>			
Fully functioning	85 (75.22)	153 (70.51)	<b>0.0112</b>
Partially functioning	28 (24.78)	64 (29.49)	
Not functioning	0 (0)	0 (0)	
<b>Do the toilets/ latrines provide privacy?</b>			
Yes	85 (75.22)	153 (70.97)	0.15
No	28 (24.78)	63 (29.03)	
<b>Total</b>	<b>113</b>	<b>217 (100)</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.3.6.2 Condition of the toilets

One hundred and fifty (69.12%) of the toilets observed in the 216 schools had closable doors that could lock from inside, 93 (42.86%) facilities had holes or cracks, while only 1 (0.46%) had windows or low walls. The findings are presented in table 4.16 below.

**Table 4. 16:** Status of WASH Facilities (Access to sanitation-condition of toilets) (Source: Author).

<b>Condition of the toilets</b>	<b>Frequency (%)</b>
Closable doors that lock from inside	150 (69.12)
Holes or cracks	93 (42.86)
Windows or low walls	1 (0.46)

#### 4.3.6.3 Toilet adaptations for youngest students

Sanitation facilities were assessed and the adaptations observed were as follows: Presence of a smaller toilet hole as observed in 67 (59.29 %) of the schools. Lowered seats and lowered door handles adaptation had only been implemented in 3 (2.65%) schools and 33 (29.2%) schools respectively. There were no visible faecal residues on the floor of 75 (66.37%) schools but there were visible used anal cleansing material in 75 (66.37%) schools. There were so surface flow in 109 (96.46%) schools but the toilets smelt bad in 70 (61.95%) schools. All toilets observed looked like they were being used 113 (100%). Presence of visible used anal cleansing material in the toilets had a significant relationship with the uptake of improved WASH practices among children in ECD schools. (P-value= 0.043 < critical value ( $\alpha$ ) =0.05). The findings are presented in table 4.17 below.

**Table 4.17: Status of WASH Facilities (Access to sanitation-toilet adaptations)**

<b>Variable</b>	<b>Uptake of WASH Services</b>	<b>Frequency</b>	<b>Chi-square &lt;0.05</b>
<b>Smaller toilet hole</b>			
No	46 (40.71)	115 (53)	<b>0.000</b>
Yes	67 (59.29)	102 (47)	
<b>Lower seat</b>			
No	110 (97.35)	211 (97.24)	0.918
Yes	3 (2.65)	6 (2.76)	
<b>Lower door handles</b>			
No	80 (70.8)	154 (70.97)	0.954
Yes	33 (29.2)	63 (29.03)	
<b>Other</b>			
No	106 (93.81)	207 (95.39)	0.245
Yes	7 (6.19)	10 (4.61)	
<b>Visible faecal residues on floor</b>			
No	75 (66.37)	154 (70.97)	0.12
Yes	38 (33.63)	63 (29.03)	
<b>Visible used anal cleansing material</b>			
Yes	75 (66.37)	130 (59.91)	<b>0.043</b>
No	38 (33.63)	87 (40.09)	
<b>Surface flow or sewage</b>			
Yes	4 (3.54)	6 (2.76)	0.468
No	109 (96.46)	211 (97.24)	
<b>The toilet smells bad</b>			
Yes	70 (61.95)	129 (59.45)	0.434
No	43 (38.05)	88 (40.55)	
<b>Does the latrine look like it is being used?</b>			
Yes	113 (100)	216 (100)	N/A
No	0 (0)	0 (0)	
<b>Total</b>	<b>113</b>	<b>217 (100)</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### **4.3.6.4 Type of Material**

Majority of the toilets in the schools had concrete floors 215 (99.54%) while only 1 (0.46%) school toilet facility had ceramic tile flooring. It was noted that all school toilets 216 (100%) had zinc, metal, and tin roofing. Many of the latrine doors were wooden 216 (97.7%) while those that had metal sheet doors were 5 (2.3%). The findings are listed in table 4.18.

**Table 4.18: Status of WASH Facilities (Access to sanitation-type of material used)**

Variable	Frequency	%
<b>Type of flooring in the latrine</b>		
Ceramic tiles	1	0.46
Concrete	215	99.54
<b>Type of roofing material</b>		
Zinc, Metal, Tin	216	100
<b>Latrine door</b>		
Metal sheet	5	2.3
Wood	212	97.7
<b>Total</b>	<b>217</b>	<b>100</b>

### 4.3.7 Hand washing with soap

The findings from the observations conducted revealed that there was a place to wash hands in 110 (97.35%) schools and there was water in the place of hand washing in 104 (92.04%) schools. There was soap, detergent, or other cleaning detergent material in the place of hand washing in 91 (80.53%) schools and the hand washing facilities were fully functioning in 96 (84.96%) schools. It was established that there was a significant relationship between availability of water in the hand washing facility and uptake of good WASH practice among children in the ECD schools (p-value=0.005). There was also a significant association between availability of soap, detergent, or other cleaning detergent material and uptake of good WASH practice among the children (p-value=0.049). The relationship between condition of the facilities and uptake of good WASH practice among the children was significant (p-value=0.014 < critical value ( $\alpha$ ) =0.05). The findings are summarized in table 4.19.

**Table 4.19: Status of handwashing facilities**

Variable	Uptake of WASH practices	Frequency	Chi-square <0.05
<b>Place to wash hands</b>			
Yes	110 (97.35)	211 (97.24)	0.918
No	3 (2.65)	6 (2.76)	
<b>Water for hand washing</b>			
Yes	104 (92.04)	183(84.33)	<b>0.005</b>
No	1 (0.88)	3 (1.38)	
Missing	8 (7.08)	31 (14.29)	
<b>Soap, detergent, or other cleaning detergent material</b>			
Yes	91 (80.53)	175 (80.65)	<b>0.049</b>
No	16 (14.16)	23 (10.6)	
Missing	6 (5.31)	19 (8.76)	
<b>Conditions of these facilities</b>			
Fully functioning	96 (84.96)	167 (76.96)	<b>0.014</b>
Partially Functioning	16 (14.16)	47 (21.66)	
Not Functioning	1 (0.88)	3 (1.38)	
<b>Total</b>	<b>113</b>	<b>217</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

### 4.3.8 Overall status of WASH facilities

There was limited access and availability of water as observed in 67 (59.29%) schools with improved access in 46 (40.71%) schools. It was also established that sanitation facilities were available in 59 (52.21%) schools that significantly influenced good uptake of WASH practices among the children ( $p$ -value=0.01 < critical value ( $\alpha$ ) =0.05). The findings further revealed that there was improved access to hand washing with soap and water in 84 (74.34%) schools and only 29 (25.66%) schools had limited access to hand washing with soap. The findings are presented in table 4.20 below.

**Table 4.20: Status of WASH Facilities (Access to sanitation-status of WASH facilities)**

Status of WASH facilities	Uptake of WASH Practices	Frequency	Chi-square <0.05
<b>Access to water</b>			
Limited	67 (59.29)	136 (62.67)	0.283
Improved	46 (40.71)	81 (37.33)	
<b>Access to sanitation</b>			
Limited	54 (47.79)	86 (39.63)	<b>0.01</b>
Improved	59 (52.21)	131 (60.37)	
<b>Access to hand washing with soap</b>			
Limited	29 (25.66)	65 (29.95)	0.150
Improved	84 (74.34)	152 (70.05)	
<b>Total</b>	<b>113</b>	<b>217</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

## 4.4 Wash practices of children in ECD schools within Nyando Sub -county

### 4.4.1 Dissemination of health and hygiene education at school

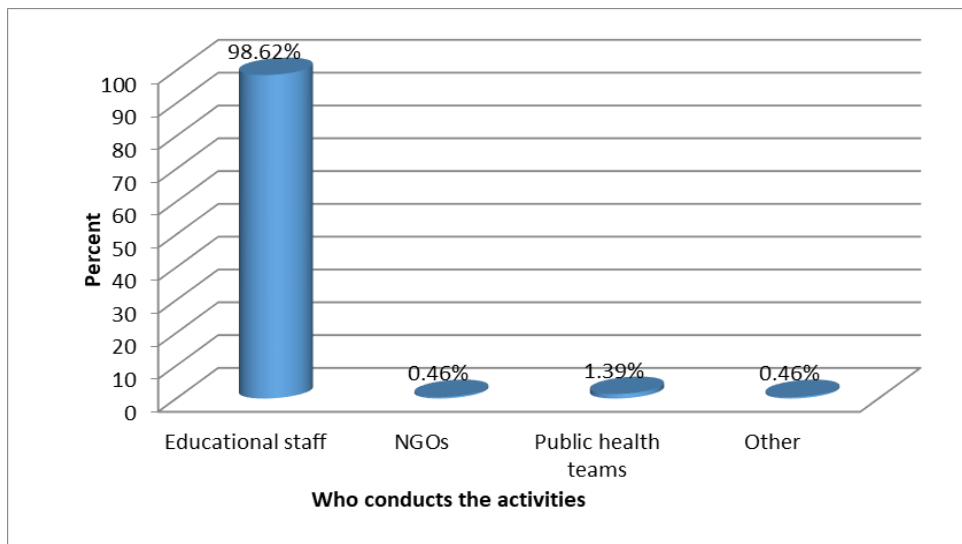
All teachers interviewed reported that they conduct conducted dissemination of health and hygiene education at school 217 (100). The findings are presented in table 4.21 below.

**Table 4.21: Dissemination of health and hygiene education at school**

Health and hygiene activities and education	Frequency	Percent
Yes	217	100
No	0	0
<b>Total</b>	<b>217</b>	<b>100</b>

#### 4.4.2 WASH activities in the ECD schools

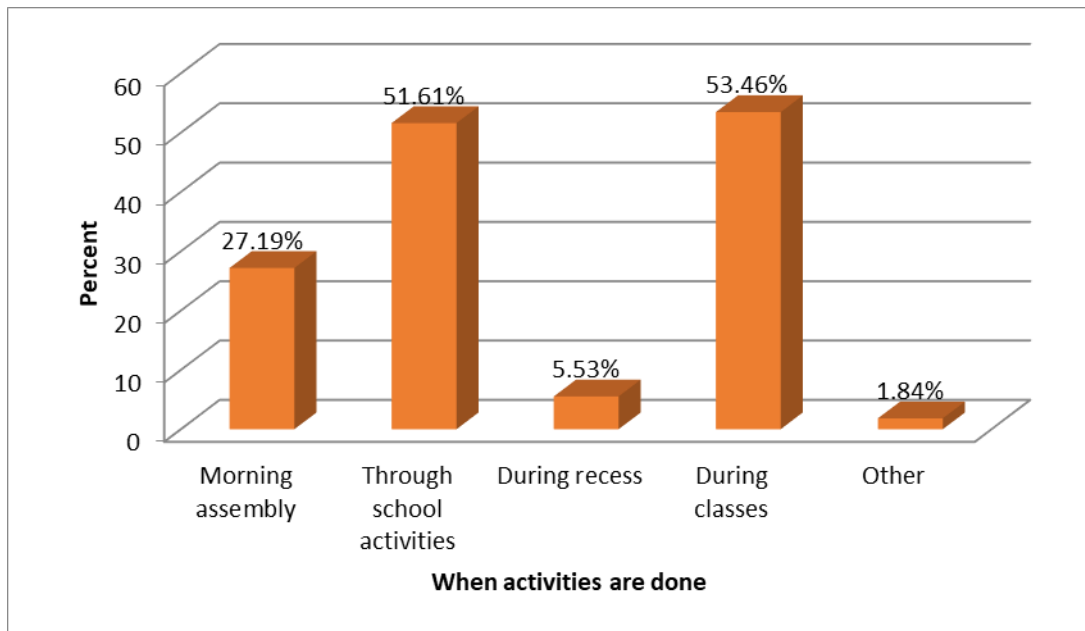
The respondents were asked to mention who takes lead in sharing information with children in ECD schools on WASH activities. Almost all the teachers 214 (98.62%) reported that the educational staff take lead in this. Three (1.39%) respondents indicated that public health teams conducted the WASH activities with only 1 (0.46%) indicated that the activities were conducted by NGOs and other people. The findings are presented in figure 4.14 below.



**Figure 4.14: Dissemination of health and hygiene activities- who conducts the activities (Source: Author).**

#### 4.4.3 Implementation of Health and Hygiene activities/ Education

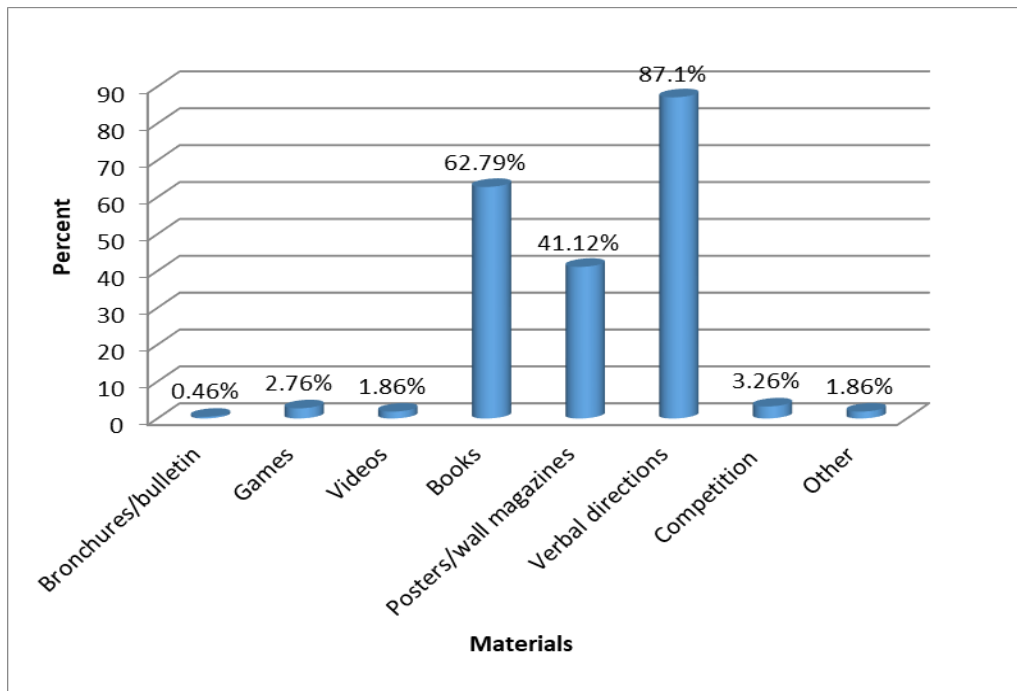
The respondents were asked to mention when health and hygiene activities/ education are conducted in the schools. One hundred and sixteen (53.46%) respondents revealed that most of these health and hygiene activities/ education are done during classes, 111(51.61%) indicated that this was done through school activities while 59 (27.19%) conducted these activities during morning assembly. Twelve (5.53%) respondents indicated that this was done during recess and 4(1.84) mentioned that the health and hygiene activities were done during other times. The findings are summarized in figure 4.15 below.



**Figure 4.15: Implementation of health and hygiene activities/ education) (Source: Author).**

#### **4.4.4 Delivery of Health and hygiene messages to pupils in ECD schools**

The respondents were asked mention the materials and methods they use to deliver health and hygiene messages to the pupils. One hundred and eighty nine (87.1%) respondents reported that they use verbal directions to teach the children on health and hygiene messages. One hundred and thirty six (62.79%) of the respondents use books to teach the children while 89(41.12%) use posters/ wall magazines were also used to disseminate information on health and hygiene. Only 1 (0.46%) respondent reported the use of brochures/ bulletin to deliver health and hygiene messages to the pupils. The findings are presented in figure 4.16 below.



**Figure 4.16: Delivery of health and hygiene messages to pupils in ECD schools (Materials for hygiene promotion) (Source: Author).**

#### **4.4.5 Pupils' involvement in health and hygiene promotion activities at schools**

The respondents were asked to mention whether they involved pupils in health and hygiene promotion activities in schools. All the respondents 217 (100%) indicated that they involve pupils in health and hygiene promotion activities. Eighty seven (76.99%) participants revealed that they involved the ECD pupils by conducting Practicals on hand washing with soap at critical times in. Sixty three (55.75%) participants indicated that they guided the pupils on proper use of latrines in schools while 80 (70.80%) respondents reported that they taught the pupils on personal hygiene. One hundred and nine (96.46%) said that they also taught the pupils on other health promotion activities. There was a significant relationship between teaching pupils on personal hygiene and uptake of WASH practices among children in ECD schools ( $p\text{-value}=0.031 < \text{critical value } (\alpha) =0.05$ ). The findings are presented in table 4.22.



**Table 4.22: Pupils Involvement in WASH activities**

Variable	Uptake of WASH practice	Frequency	Chi-square < 0.05
<b>Pupil involvement</b>			
Yes	217 (100)	217 (100)	
No	0 (0)	0 (0)	
<b>Practicals on hand washing</b>			
No	26 (23.01)	49 (22.58)	0.875
Yes	87 (76.99)	168 (77.42)	
<b>Guiding on proper use of latrines</b>			
No	63 (55.75)	110 (50.69)	0.12
Yes	50 (44.25)	107 (49.31)	
<b>Teaching on personal hygiene</b>			
No	33 (29.20)	78 (35.94)	<b>0.031</b>
Yes	80 (70.80)	139 (64.06)	
<b>Other</b>			
No	109 (96.46)	212 (97.7)	0.206
Yes	4 (3.54)	5 (23)	
<b>Total</b>	<b>113</b>	<b>217 (100)</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.4.6 Confidence in teaching

Majority 111 (98.23) of the teachers felt confident in teaching their pupils on sanitation and hygiene education after being trained and they discussed general hygiene behaviors in school during general staff meetings 112 (99.12). The findings are presented in table 4.23 below.

**Table 4.23: Confidence in teaching**

Variable	Uptake of WASH practice	Frequency	Chi-square < 0.05
<b>Do you feel confident teaching pupils on WASH</b>			
Yes	111 (98.23)	214 (98.62)	0.61
No	2 (1.77)	3 (1.38)	
<b>Discussing on general hygiene behaviors</b>			
Yes	112 (99.12)	215 (99.08)	0.953
No	1 (0.88)	2 (0.92)	
<b>Total</b>	<b>113</b>	<b>217 (100)</b>	

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.4.7 Discussions on general hygiene behaviors by teachers during staff meetings

Majority of the respondents revealed that they neither discussed on building new sanitary toilets 93 (82.3%) nor on improving sanitary toilets 76 (67.26%) during their staff meetings. It was noted that teachers discussed on hand washing facilities 83 (73.45%), safe water treatment 64 (56.64%), personal hygiene of the pupils 83 (73.45%), and general cleanliness of the school 63 (55.75%). They however did not discuss issues on waste management 76 (67.26%) and water conservation 102 (90.27%). There was a significant relationship between the discussions held by teachers on general cleanliness. The findings are presented in table 4.24 below.

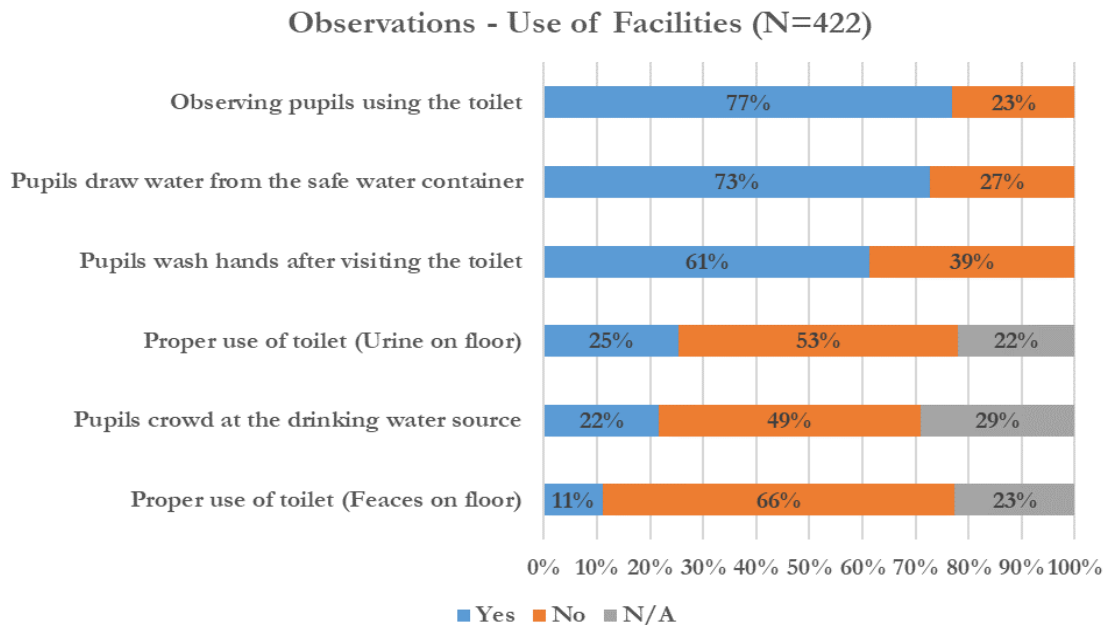
**Table 4.24: Discussions on general hygiene behaviors**

<b>Discussions on general hygiene behaviours</b>	<b>Uptake of WASH practices</b>	<b>Frequency</b>	<b>Chi-square &lt;0.05</b>
<b>Build new sanitary toilets</b>			
No	93 (82.3)	175 (80.65)	0.52
Yes	20 (17.7)	42 (19.35)	
<b>Improve sanitary toilets</b>			
No	76 (67.26)	145 (66.82)	0.887
Yes	37 (32.74)	72 (33.18)	
<b>Hand washing facilities</b>			
No	30 (26.55)	62 (28.57)	0.492
Yes	83 (73.45)	155 (71.43)	
<b>Safe water treatment</b>			
No	49 (43.36)	95 (43.78)	0.898
Yes	64 (56.64)	122 (56.22)	
<b>Personal hygiene of the pupils</b>			
No	30 (26.55)	68 (31.34)	0.113
Yes	83 (73.45)	149 (68.66)	
<b>General cleanliness of the school</b>			
No	50 (44.25)	102 (47)	0.396
Yes	63 (55.75)	115 (53)	
<b>Waste management</b>			
No	76 (67.26)	145 (66.82)	0.887
Yes	37 (32.74)	72 (33.18)	
<b>Water conservation</b>			
No	102 (90.27)	194 (89.4)	0.666
Yes	11 (9.73)	23 (10.6)	
<b>Other</b>			
No	109 (96.46)	213 (98.16)	0.538
Yes	4 (3.54)	4 (1.84)	
<b>Total</b>	<b>113</b>	<b>217</b>	<b>00)</b>

Uptake of WASH practices refers to Improved WASH practices among children in ECD schools and availability of Improved WASH facilities in the ECD schools

#### 4.4.8 Children’s WASH Practices

Four hundred and twenty-two children were observed during break time as they were using the WASH facilities in the schools. 61% of the pupils washed hands after visiting the toilet while only 11% properly used the facilities with no faeces in the toilet and 53% left urine on the floor. 73% drew drinking water from the safe storage container. The findings are summarized in figure 4.17 below.



**Figure 4.17: Children’s WASH Practices (Observation of pupils using WASH facilities)**  
(Source: Author).

### 4.5 Measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando sub-county

#### 4.5.1 Sustainability Measures put in place

##### 4.5.1.1 WASH Challenges in ECD schools

The KII respondents were requested to share the challenges faced by ECD Children in accessing safe water, sanitation and hygiene services in the ECD schools. On access to sanitation, the school head teachers mentioned that in their respective schools, the ECD children share sanitation facilities with the primary school pupils. On probing, the head teachers stated that sharing the sanitation facilities limits access to proper use of the sanitation facilities by the young children. In addition, they revealed that the facilities present in the schools are not adequate to serve the school population and do not meet the school health policy guidelines on toilet ratios for boys and girls. This was reiterated by the zonal

coordinator Ahero, who mentioned that the ECD schools are required to provide adequate sanitation facilities that are child-friendly to encourage use. However, this is not the case due to funding limitations. She further reported that the facilities often smell making it uncomfortable especially for the young children;

*'The Children are not comfortable at all, it is just that they have no choice. The toilets smell and sometimes they are not very clean.'* Zonal Coordinator Ahero

On access to water, the respondents mentioned that the ECD schools in majority of the schools do not have their own water sources. They rely on water supplied to the public section of the schools. The head teachers reported that they are required to fetch water and fill in the drinking water containers and the handwashing containers. The sub County ECD coordinator, reported that it is important to have a drinking water source in the schools. Rain water harvesting tanks can be installed to support these institutions. She further stated that the department is experiencing funding challenges, however, WASH is one of the department's top priority especially for ECD schools.

On hygiene, the ECD school head teachers reported that they only have one handwashing facility shared among the two classes and further stated that that was not enough given the high population in the school. The zonal coordinator Awasi also indicated that handwashing with soap is a challenge as the disinfectants such as soap are not available at all times. The ECD school head teachers further indicated that they do not have budgets for WASH services in the schools, hence the WASH materials are bought once the pupils have paid their fees and part of it is used to buy the items. In one of the schools, the head teacher reported that they utilize about two thousand (2,000) Kenya shillings to purchase the WASH items.

#### **4.5.1.2 Interventions in place to address the challenges**

The KII respondents were asked to describe the current WASH interventions in place to address the WASH challenges. Qualitative data obtained from the sub county and zonal ECD Coordinators indicated that there is intended support from the county governments in provision of WASH services in schools. The county has allocated budgets for the construction of child friendly WASH infrastructure, however, this is yet to be actualized. They further stated that there is support from partners to advocate for increased allocation of WASH services targeting ECD institutions. The sub county zonal coordinator reported that much of the support received on WASH is from partners such as UNICEF, SWAP, and KIWASH/USAID. The zonal coordinators further reported that the partners provided support especially during the COVID-19 pandemic by distributing handwashing facilities to various

schools. The Zonal Coordinators in Awasi and Nyangande reported that KIWASH/USAID was constructing sanitation facilities at Hongo Ongosa and Migingo primary schools. The four door sanitation facilities are to be shared by both primary and ECD school children. The respondents further reported that the County has been working closely with the partners to supplement interventions on WASH in schools. The Zonal Coordinator Awasi further reported that the County government has supported the construction of ECD classrooms in a number of ECD schools such as Karanda, Yogo, Wanganga and Olasi primary schools. The ECD children are yet to occupy the classrooms yet as they are yet to be fully completed.

#### **4.5.1.3 Sustainability Measures in Place**

The KII participants mentioned the following efforts that have been put in place to ensure access to sustained WASH services in schools. These included the inclusion of school parents committees in lobbying for resources for WASH infrastructure development and maintenance. The head teachers interviewed reported this upon indicating that there were no funds allocated for WASH. He mentioned that they reach out to well-wishers and parents in supporting interventions. The head teacher quoted the following while showing the handwashing facility purchased by a well-wisher; *'As you can see, this handwashing station was bought by one of the parents who sourced for funds from the friends and bought this for us.'* Centre manager, Awasi ECD Centre

Other measures mentioned by the sub county zonal included Intersectoral collaboration. The coordinator indicated that support from various departments addressing WASH issues could contribute to addressing the WASH challenges and lead to sustainability. In addition, the respondents listed budget allocation for WASH services at county level and prioritization of ECD WASH service provision. The Sub County zonal coordinator indicated that this could be actualized through the implementation of the County ECD guidelines and policies. The Sub County Zonal Coordinator also reported that through the County teams and partners, the ministry of Education is advocating for sustained WASH Financing through the County WASH forums and policy makers.

### **4.6 Summary of Findings**

#### **4.6.1 Level of Knowledge of Teachers in ECD Schools on WASH and its influence on Children's WASH Practices.**

The findings indicate that 78 (69%) respondents received training/ information on water, sanitation and hygiene. Out of the 78, 45(40 %) confirmed that the training was delivered as

part of the ECD training curriculum, with 33 (39%) stating that the training was delivered by public health officers. Majority of the teachers 67(59%) indicated that the training took place for a period of less than one week, with 38(34%) reporting that the trainings took place within a day. Two hundred (92%) teachers further reported that the training was not sufficient and proposed that the trainings should be improved by increasing the training period and improving on mode of delivery. Subsequently, 154 (71%) of the teachers did not receive any refresher trainings. The 39 (18%) who participated in refresher trainings indicated that the refresher trainings were conducted as part of the ECD training curriculum. Only 56 (26%) teachers were provided with educational materials during the refresher trainings, with majority of them indicating that the educational materials were not helpful in teaching the children on water, sanitation and hygiene issues afterwards. The Pearson chi-square statistical test indicated that there was no statistical significance between the training or information received by the teachers and the uptake of WASH practices among the children in ECD schools. There was also no statistical significance between the length of training on WASH and the uptake of WASH among children in ECD schools

With regard to the knowledge on sources of water, 103 (91%) of the teachers mentioned natural springs, 111(98%) mentioned lakes and rivers, 98 (87%) mentioned boreholes/ wells while 101 (89%) mentioned rain water. This indicated that the teachers had accurate knowledge on the sources of water. Pearson Chi-Square statistical test, indicated a statistically significant association between boreholes/ wells as a water source and the uptake of WASH practices among children in ECD schools ( $p\text{-value} = 0.012 < \text{critical value } (\alpha) = 0.05$ ). More than half of the teachers 89 (78%) had the accurate knowledge on the importance of making water safe for drinking. They mentioned that it was important to make water safe for drinking so as to kill germs, 81 (72%) mentioned to make it safe for drinking and 64 (57%) reported that it was important to make water safe so as to reduce chances of diarrhea. There was no statistical significance on the knowledge of teachers on making water safe for drinking and the uptake of WASH practices among children in ECD schools.

The teachers had accurate knowledge on the water treatment techniques with 100 (86%) and 98 (97%) mentioning the use of water treatment chemicals such as *water guard* and boiling respectively. The teachers knowledge on boiling as a water treatment technique was statistically significant with the uptake of WASH practices among children in ECD schools in Nyando ( $p\text{-value} = 0.006 < \text{critical value } (\alpha) = 0.05$ ).

On knowledge towards sanitation, the teachers had accurate knowledge on why faeces should be disposed of in a proper way. Seventy five (66%) teachers mentioned that it is important to dispose of faeces in a proper way so as to avoid contamination of water supplies and soil. Fifty four (48) indicated that human faeces should be disposed of in a proper way as they contain germs while 37 (33%) of the teachers mentioned that proper disposal of faeces prevents smell. The teacher's knowledge on proper disposal of human wastes so as to avoid smell was statistically significant with the uptake of WASH among children in ECD schools ( $p\text{-value} = 0.026 < \text{critical value } (\alpha) = 0.05$ ). The teachers also had accurate knowledge of the importance of using a toilet with 104 (92%) stating that it was important to use a toilet for health purposes while 43 (38%) revealed that it was important to use a toilet to avoid smell. The teachers knowledge on the importance of using a toilet with regard to smell purposes was statistically significant with the uptake of WASH practices among children in ECD schools ( $p\text{-value} = 0.001 < \text{critical value } (\alpha) = 0.05$ ).

The teachers had accurate knowledge towards handwashing practices. Over 50% of the participants mentioned 5 critical times of handwashing with soap that included before cooking, before eating, after eating, after using the toilet and after changing the baby. On the importance of washing hands with soap, 90 (80%) of the teachers indicated that it was important to wash hands with soap and water so as to reduce chances of getting diarrhea. There was no statistical significance on the knowledge of teachers on handwashing practices and the uptake of WASH practices among children in ECD schools. On knowledge towards diseases, 161 (74%) of the respondents had heard about faecal oral diseases, however, 81 (37%) gave the incorrect definition with 54 (25%) admitting that they did not know the meaning of faecal oral diseases. Only 78 (35%) gave the correct definition of faecal oral disease transmission. They therefore did not have accurate knowledge on WASH related diseases.

#### **4.6.2 Status of the WASH Facilities in ECD Schools in Nyando Sub County**

The study findings on the status of WASH facilities in ECD schools in Nyando indicate that 82 (73%) of the schools had a drinking water source that was protected. There was a tap present at the water source in 75 (67%) of the schools and water was flowing in 58(51%) of the schools. There were no leakages in 61 (54%) of the schools with drinking water containers available in 82 (73%) of the schools. The drinking water containers were covered in 75 (66%) schools. However, the storage containers did not have narrow necks in 83(73%) of the schools. the Chi-square test of association on the availability of WASH facilities in

schools indicated a statistical significance on the availability of a functional drinking water source ( $p\text{-value}=0.008 < \text{critical value } (\alpha) =0.05$ ) and proper storage and covering of drinking water containers ( $p\text{-value}= 0.022 < \text{critical value } (\alpha) =0.05$ ) on the uptake of WASH practices among children in ECD schools.

The sanitation facilities observed were fully functioning in 85 (75.22%) and partially functioning in 28 (24.78%) of the schools. There was privacy in 85 (75.22%) of the schools and 150 (69.12 %) schools had closable doors. Toilet adaptations had been done 67(59.29) and they had smaller toilet holes. There were visible anal cleansing materials in 75 (66%) of the schools with surface flow in 109 (96%) of the schools. In addition, the toilets had bad smell in 70 (61.95%) of the schools. There was a statistical significance between the functionality of the sanitation facilities and uptake of WASH practices among children in ECD schools. There was also statistical significance on the presence of visible used anal cleansing materials ( $p\text{-value}=0.043 < \text{critical value } (\alpha) =0.05$ ) and the uptake of WASH practices among children in ECD schools.

There was a handwashing facility present in 110 (97%) of the schools with soap, detergent or other cleaning detergent present at the handwashing station in 91 (81%) of the schools. the handwashing facilities were fully functional in 96 (85%) of the schools. It was established that there is a significant relationship between availability of water in the handwashing facilities ( $p\text{-value}= 0.005 < \text{critical value } (\alpha) =0.05$ ) and uptake of WASH practices among children in ECD schools. There was also a significant relationship between the condition of the facilities ( $p\text{-value}=0.014 < \text{critical value } (\alpha) =0.05$ ) and the availability of soap, detergent or other cleaning detergent material ( $p\text{-value}= 0.049 < \text{critical value } (\alpha) =0.05$ ) on the uptake of WASH among children in ECD schools.

#### **4.6.3 WASH Practices of Children ECD Schools within Nyando Sub County**

The study further established that all schools conducted dissemination of health and hygiene education at school. These activities were mainly conducted by the educational staff 214 (98.62%). This dissemination of hygiene and health education was majorly done during classes in 116 (53.46%) schools and the main methods used to deliver health and hygiene or education information was through verbal directions as reported by 189 (87.1%) teachers. All pupils were involved in maintaining and promoting hygiene as reported by the 217 (100) teachers. This was done through practical's on handwashing with soap as reported by 87 (76.99 %) teachers, personal hygiene as reported by 80(71%) teachers while 63 (55%)



reported that they direct the children on proper toilet use. There was a significant relationship between teaching pupils on personal hygiene and uptake of WASH practices among children in ECD schools ( $p\text{-value}=0.031 < \text{critical value } (\alpha) =0.05$ ). Majority of teachers 111 (98.23) felt confident in teaching pupils on WASH practices. On observation, 204 (53%) pupils did not use the toilets well and there was urine and faeces on the floor, 234 (61%) washed hands after visiting the toilet, and 188 (49%) did not crowd at the drinking water source.

#### **4.6.4 Sustainability Measures in Place to ensure sustained access to WASH services in ECD Schools in Nyando Sub County**

The measures put in place to sustain access to WASH in ECD schools include stakeholder involvement, who are; the school parents, partners and the County Government. Majority of the support on WASH interventions and infrastructure is from the partners. School Community participation in decision making on resource allocation for WASH services also took place as parents were consulted and involved on the WASH needs of the schools such as purchase of commodities like handwashing soap, handwashing containers and safe drinking water containers. Other measures in place include Intersectoral collaboration with the ministry of health, who through the public health department offer technical support in sensitization of both pupils and teachers on handwashing with soap and water treatment. Advocacy at County level on resource allocation for WASH interventions in ECD schools is done through the ministry of Education, WASH stakeholders forums and policy makers.

## **CHAPTER FIVE**

### **DISCUSSION**

#### **5.1 Introduction**

This chapter presents the discussion on the findings on the specific research questions which were to; assess the level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children's WASH practices in Nyando Sub County, investigate the status of WASH facilities in the ECD schools, observe the WASH practices of children in the ECD schools and to evaluate the measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County.

#### **5.2 Discussion**

##### **5.2.1 Level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children's WASH practices**

Teachers are important in influencing the WASH behavior of children in schools. This study findings resonate with the findings from the study conducted by (Karon et.al,2017), which acknowledged that students who gain knowledge and hygiene skills from their teachers are more likely to adopt and replicate improved hygiene practices such as handwashing with soap and proper toilet use. The findings in this study indicated that teacher's knowledge on water sources ( $P=0.012$ ), water treatment technologies ( $P=0.006$ ) and proper toilet use ( $0.026$ ) were found to have a significant relationship with the uptake of improved WASH practices among children in the schools.

The teachers had accurate knowledge on water sources, water treatment techniques and understood the importance of making water safe. The teachers however did not have knowledge on fecal oral disease transmission. This indicated that they could not adequately conceptualize how WASH related diseases are transmitted. The findings on inadequate knowledge on fecal oral disease transmission complement those by Melariri et.al, (2019). Poor hygiene standards and behavioral practices among children in ECD schools are often attributed to lack of knowledge and information on WASH related illnesses by the teachers and school management. This study recommends the need to actively involve teachers in ECD schools in promoting improved WASH practices among the children. This can be done through building the capacity of both teachers and children on WASH and focusing mainly on fecal oral disease transmission which was the major gap identified in this study.

The study findings also compared well with the recommendations on the WHO 2019, school WASH report that advocates for inclusive WASH training for teachers and pupils through practicals and demonstrations on improved WASH behaviors. The teachers in Nyando sub county recommended the need to have more practical sessions that are engaging and have WASH educational materials suitable for the children in this age cohort. A major limitation to the trainings received by the teachers in Nyando was that they did not have adequate educational and resourceful materials to be used for teaching the ECD children. Regular workshops on WASH for teachers by education and health stakeholders would be beneficial to ECD schools for sustained WASH services and practices in the schools.

### **5.2.2 Status of WASH facilities in ECD schools in Nyando Sub County**

Children spend up to six hours in a day at school where adequate WASH services are required to be available and safe to contribute to the improvement of their overall wellbeing by decreasing the potential for transmission of WASH related illnesses. WASH in schools is recognized globally through the SDGs as key components of an inclusive and safe learning environment. The findings on the status of WASH facilities in ECD schools in Nyando indicate that majority of the schools have a drinking water source available and presence of sanitation and handwashing facilities. The sanitation facilities are however not in good condition and limit proper usage. The findings compare well with the results from the study conducted in Kakamega County, Kenya by Faiza, 2015. The results from this study also indicated that the sanitary facilities in schools within the region were in poor condition and in almost 50% of the schools, the facilities did not meet the required public health standards. The findings from both studies are a clear indication that investment in school WASH infrastructure development and operation and maintenance of the facilities is in most cases not accorded due priority, ultimately leading to negative health effects on pupils.

This also resonates with the findings in a school survey conducted in rural schools in South Africa where the schools had inadequate sanitation facilities and are in poor condition for use with majority using pit latrines (Jerry, 2013). The school sanitation facilities in Nyando subcounty are mainly pit latrines with no vent pipes which also contribute to the poor hygienic conditions as a result of smell and flies. The schools need to strengthen their operation and maintenance systems by ensuring the facilities are regularly cleaned and human fly contact is further minimized to reduce fecal oral disease transmission. To ensure the sustainability of WASH facilities in the schools, budgetary allocation for management of the facilities is imperative. This should include regular disinfection, cleaning and overall

maintenance of the facilities so as to be more user friendly. These findings also agree with a study conducted by Lawrence et al. (2016) that recommends that ECD schools should have adequate child friendly sanitation facilities that are hygienic to use and easy to clean with functional handwashing facilities strategically placed. This will promote better use of the facilities by the children. From the discussions above, it should be noted that the availability of sanitation facilities needs to be accompanied with proper direction on use and regular maintenance and disinfection to facilitate proper usage. Factors including smell and cleanliness have an influence on the functionality.

The availability of soap and water in school promotes improved hand hygiene practices among the students. From the study findings, only 96 schools had a functional handwashing station. This is in contrast with the study conducted by Emmanuel Appiah (2018) where in his study few schools had handwashing stations. The availability of the handwashing stations in this study could be attributed to the ongoing COVID-19 pandemic. These study findings are also similar to the findings on the study conducted by (Minal, 2012) that indicated that the presence of functional handwashing stations can improve the knowledge and handwashing practices among the school children. This study findings complement the findings by (Chad et.al,2018) that availability of functional water, sanitation and hygiene facilities can lead to good uptake of WASH practices among pupils. ECD schools should therefore provide adequate WASH facilities to improve their overall WASH behaviors, both at home and at school.

### **5.2.3 WASH practices of Children in ECD Schools**

The children's active participation in water and environmental activities in schools contributes to their holistic development. According to the Sustainable Development Goals, WASH needs to be magnified beyond household settings to institutions in order to obtain equitable and universal access to clean and affordable drinking water, hygiene, and sanitation for every human. Access to WASH facilities in schools leads to equity, inclusion and dignity among pupils and improved uptake of improved WASH Behaviors. This study was conducted in a school setting targeting children with an aim of assessing the factors influencing uptake of their WASH practices in the ECD schools. The study is similar to that of Olayiwole et al. (2014) on the promotion of sanitation and hygiene by using children as change agents as they were both conducted in line with the UNICEF rights-based approach on access to water and sanitation as a right of every child.

The study established that all schools conducted dissemination of health and hygiene education at school. These activities were mainly conducted by the educational staff and were majorly done during classes. The main methods used to deliver health and hygiene or education information to children was through verbal directions. This was also done through practicals on handwashing with soap, demonstrations on proper toilet use and personal hygiene. There was a significant relationship between teaching pupils on personal hygiene and uptake of WASH practices among children in ECD schools. On observation, 224 (53%) pupils did not use the toilets well and there was urine and faeces on the floor, 257 (61%) washed hands after visiting the toilet, and 207 (49%) did not crowd at the drinking water source. In order to reinforce improved WASH practices among the children in ECD schools, there is need to have functional WASH facilities coupled with hygiene education. The schools should ensure that the facilities are hygienic to use and easy to clean and strategically situated to promote access (Zomerplaag, 2015).

#### **5.2.4 Measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools**

The results on the sustainability measures in place in ECD schools in Nyando indicated that the schools through the ministry of education are advocating for increased WASH allocation to ECD schools. These findings complement the findings by Kelly T Alexander et al, (2013) that schools can improve on WASH services through use of existing school administrative budget plans. This includes allocating budgets for WASH operational costs to enhance operation and maintenance of facilities and enhance access to improved WASH services. However, in order to ensure sustainable service delivery to students, there is need for continuous health education, appropriate monitoring on utilization of funds and intensified intersectoral collaboration. The findings of this study on the sustainability measures in place to support WASH services are also similar to the study conducted by Gunhu et al, (2011), which indicated that most schools rely on donors and partners to support WASH service provision. This subsequently affects the sustainability of hygiene and sanitation activities. It is therefore imperative to integrate WASH in schools by providing simple enabling infrastructure coupled with health education on the importance of improved WASH practices contributes to the sustainability of WASH practices among children.

## **CHAPTER SIX**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Introduction**

This chapter presents the conclusion and recommendations based on the findings on the specific research questions which were to; assess the level of knowledge of teachers in ECD schools on Water, Sanitation and Hygiene and its influence on the children's WASH practices in Nyando Sub County, investigate the status of WASH facilities in the ECD schools, observe the WASH practices of children in the ECD schools and to evaluate the measures put in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County.

#### **6.2 Conclusion**

- i. The study established that teacher's knowledge on water sources ( $P=0.012$ ), water treatment technologies ( $P=0.006$ ) and importance of toilet use ( $0.026$ ) had significant relationship with the uptake of WASH among the children in the ECD schools. The teachers had accurate knowledge on water, sanitation, and hygiene
- ii. The ECD schools in Nyando have functional water, sanitation and handwashing facilities. The water and handwashing facilities were in good condition. However, the toilets had foul smell with visible anal cleansing materials and surface flow. The functionality of the Water, sanitation and hygiene facilities had an influence on the uptake of WASH practices among the children in ECD schools.
- iii. The ECD children in Nyando practice handwashing with soap after visiting the toilet, they did not crowd at the drinking water containers. They however did not properly use the toilets and left urine on the floor.
- iv. The measures in place to ensure sustained access to water, sanitation and hygiene services in ECD schools in Nyando Sub County include Intersectoral collaboration and resource allocation.

#### **6.3 Recommendations**

The following recommendations were made based on the findings and the conclusions of the study:

- i. Refresher sessions for teachers on the link between WASH and diarrheal diseases should be conducted by the departments of Education and Health.

- ii. Teachers should be provided with educational materials by the Education Department which are relevant in teaching children on improved WASH practices.
- iii. The ECD schools in Nyando should intensify general cleanliness and maintenance of sanitation facilities and train children on proper use of the facilities by the ECD children.
- iv. The County Government through the ministry of Education, Early Childhood Development Education department should ensure full and exhaustive implementation of the ECD budgets and further allocate and utilize resources for provision of WASH infrastructure alongside classroom construction. This will enable the ECD children to learn in a conducive environment that is key for their developmental growth

#### **6.4 Suggestions for further research**

The following suggestions were made during the study, discussions on the same were not adequately underscored hence the need for more research on the same:

- i. A study should also be conducted to establish the prevalence of Water, sanitation and hygiene related diseases among children in ECD schools in Nyando sub county

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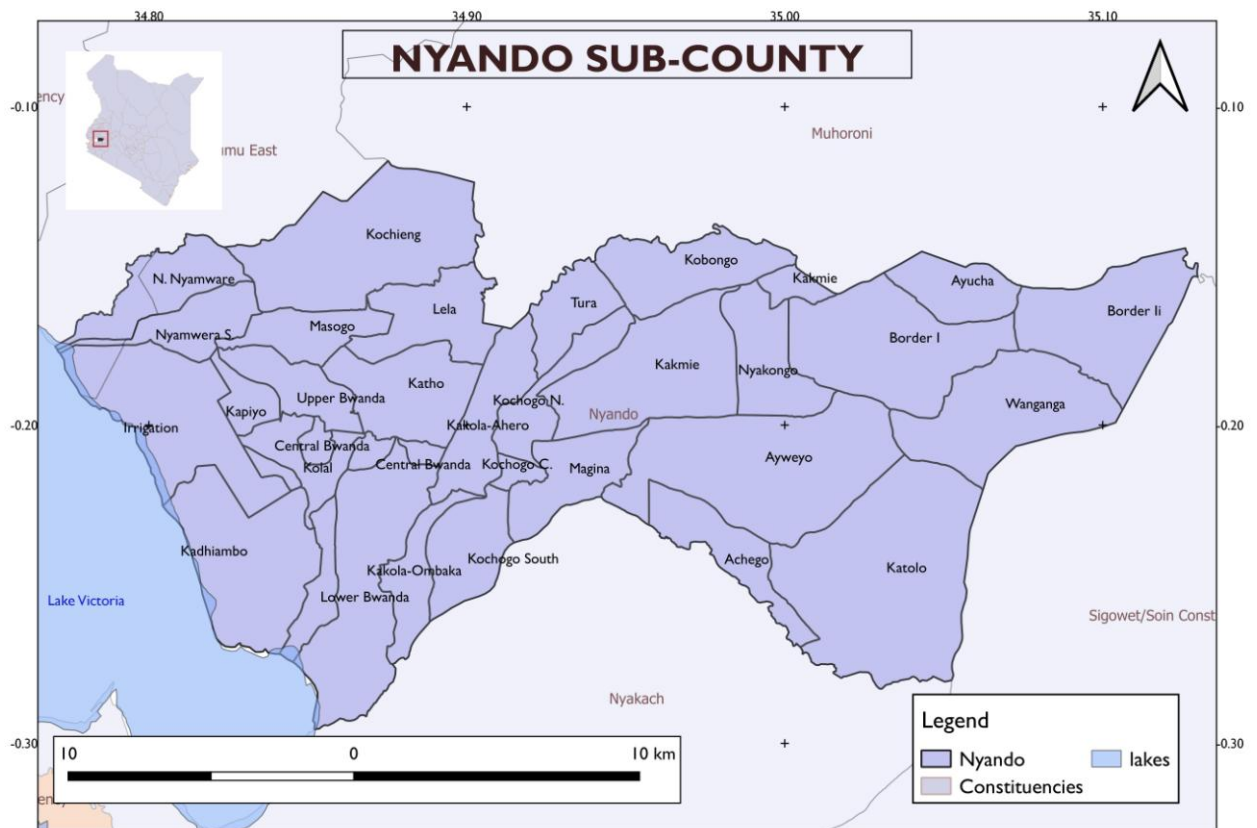
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# APPENDICES

## Appendix I: Map



## Appendix II: Questionnaire

### What is your role at this school?

Head teacher.....1

Deputy Head teacher.....2

Teacher .....3

None of the above available...4  **STOP**

### Interview Start Time:

HH:MM: SS

## 4.2 SCHOOL TEACHERS QUESTIONNAIRE

School Water, Sanitation and Hygiene		
	Questions	Responses option(s)
A	<b>General information</b>	
1	Interview Date	
2	Interviewer Name	
	<b>Location</b>	
3	Record GPS	
4	School No.	
	<b>Teacher information</b>	
5	Gender	Male                      Female
6	Age	
7	Grade/ PP	
8	Any other role in the school?	
9	What is your level of Education	1. Primary School 2. Secondary School 3. Certificate 4. Diploma 5. Degree 6. Masters
	<b>B Source of knowledge on Water, Sanitation and Hygiene</b>	
1	Have you ever received any training/information on safe water, sanitation and hygiene?	Yes                      No
2	If Yes, where did you receive information/ training on safe water, sanitation and hygiene promotion? (Check all that apply).	Public health officers
		Part of school training curriculum
		Community /family/friends
		Other (specify)

3	How long was the training/workshop on safe water, sanitation and hygiene?	Less than 1 week		
		1 week		
		2 weeks		
		1 month		
		Other		
4	Do you think the training was sufficient?	Yes		No
a	What can be done to improve on this training?	Increase training period		
		Change facilitator		
		Improve on mode of delivery		
		Other-explain		
5	Can you mention a few topics you covered on safe water, sanitation and hygiene promotion (Check all that apply)	Access to safe water		
		Safe Water treatment techniques		
		Sources of Safe water		
		Access to Sanitation		
		Qualities of an improved latrine		
		Handwashing with soap		
		Handwashing with soap techniques		
		Others...List		
6	Have you received any refresher trainings/information/courses on safe water, sanitation and hygiene?	Yes		No
7	If Yes, who facilitated these refresher trainings?	The School management		
		Part of my training as an ECD teachers		
		NGO		
		Public Health teams		
		Other		
8	Were you provided with educational materials during your trainings?	Yes		No
a	To what extent do you feel that these documents helped you to teach your students about sanitation and hygiene afterwards?	Very helpful		Not very helpful
				Not Helpful
b	How could this training be improved?	More theoretical		
		More practical		
		Additional resource/educational materials		
		Other-Specify		
<b>C Dissemination of health and hygiene education at school</b>				
9	Does your school conduct health and hygiene activities and education to the pupils?	Yes		No (If No, Skip to number
10	If yes, who conducts these activities?	Educational staff (teacher, assistant		



		etc.)
		NGOs
		Public health teams
		Other (Specify)
11	When do you conduct health and hygiene activities/education? Check all that apply.	During Morning assembly
		Through the school activities
		During recess time
		During the classes
		Other (specify)
12	If yes, how frequently are these health and hygiene activities/ education conducted?	Once a year
		Once or twice per term
		Once or twice in a month
		Once or twice in a week
		Every day
		I don't know
13	If yes, what approach do you use to promote/ conduct health and hygiene education in your school? Check all that apply.	Use of Brochures/ bulletins
		Through Games
		Through Videos
		Books
		Posters/wall magazines
		Verbal directions
		Through Competition
		Other
14	Are the pupils involved in health and education promotional activities in school?	Yes
		No
15	If Yes, how are the ECD pupils involved in health and hygiene promotion activities at school?	Practicals on handwashing with soap at critical times
		Training/Guiding on proper use of the latrines
		Teaching on personal hygiene
		Other
16	Do you feel confident teaching your pupil's sanitation and hygiene Education after being trained	Yes
		No
17	Do you discuss general WASH issues in school during your staff meetings?	Yes
		No
18	What WASH do you discuss about? Check all that apply.	Build new sanitation facilities
		Improve sanitation facilities
		Handwashing facilities
		Safe Water Treatment
		Personal hygiene of pupils
		General cleanliness of the school

		Waste management
		Water Conservation
		Other
<b>D</b>	<b>Knowledge towards water, sanitation and hygiene</b>	
	<b>Knowledge towards water</b>	
19	Name 5 sources of Water that you know of	Natural Springs
		Lakes and rivers
		Rain water
		Wells /Boreholes
		Other
		Don't Know
20	To your knowledge, why is it important to make water safe for drinking? Check all that apply.	To Kill germs
		To Make it safe for drinking
		To Reduce the chances of getting diarrhea
		To Give the water a better taste
		Other (specify)
21	To your knowledge, what are the safe water treatment techniques you know of? Check all that apply	Boiling
		Add water treatment chemicals such as water guard
		Filtration
		Solar disinfection
		Sedimentation
	<b>Knowledge towards sanitation</b>	
22	To your knowledge, why should human faeces be disposed of in a proper way (as opposed to open defecation)? Check all that apply.	It contains germs
		To Avoid contaminating water supplies and soils
		To prevent Smell
		Do not know
23	To your knowledge, why is it important to have and use a toilet? Check all that apply.	For Health purpose
		To prevent Smell
		For Status in family/ community
		Because it is good to use a toilet
		Other (specify)
24	In your knowledge what is the proper use of toilet? Check all that apply.	Washing hands after using the toilet
		Flushing the toilet with water after use
		Not throwing and leaving toilet paper on the floor
		Turning off the faucet firmly and not leaving it turned on
		Defecating/urinating in the toilet bowl
		Not throwing solid objects into the toilet

		Avoiding spilling water on the floor	
		Other (specify)	
<b>Knowledge towards hand washing practices</b>			
25	To your knowledge, what are the critical times to wash your hands? Check all that apply.	Before cooking	
		After changing the baby	
		When you wake up from sleep	
		After taking care of sick patients	
		After using toilet	
		After eating	
		Before eating	
		Other (specify)	
26	To your knowledge, why is it important to wash your hands using water and soap? Check all that apply.	To Reduce the chances of getting diarrhea	
		To Reduce the chances of getting other diseases/ infections	
		To keep hands clean	
		To Reduce stomach-ache	
		Religious beliefs	
		Other (specify)	
27	Can you list the steps of handwashing with soap?	Yes- Kindly let them list and check handout	
		No	
		Has listed, however, incorrectly	
		I have forgotten	
<b>Knowledge towards diseases</b>			
28	Have you heard of fecal-oral disease transmission?	Yes	No
29	If Yes, what does it mean	Contaminated faeces from an infected person are ingested by another person	
		Faeces are ingested by another person	
		I can't remember	
		I don't know	
30	To your knowledge, how can you protect yourself against fecal-oral diarrheal diseases? Check all that apply.	Eat washed fruits and vegetables	
		Eat non-contaminated and unspoiled food	
		Use clean toilet	

	Drink clean/boiled water
	Use clean water
	Wash hands with soap
	Wash hands with soap after cleaning young children
	Wash hands before eating
	Wash hands after using toilet
	Other (specify)

**OBSERVATION CHECKLIST: STATUS OF WASH FACILITIES IN ECD SCHOOLS**

<b>A</b>	<b>Access to Water</b>		
1	Can you show me the drinking water source?	Yes	No
2	Is the drinking water source protected?	Yes	No
3	Is there a tap?	Yes	No
4	If there is a tap does water flow out of the tap?	Yes	No
5	If there is a tap, does the tap leak	Yes	No
6	Can you show me the drinking water storage container?	Yes	No <b>SKIP TO NEXT SECTION</b>
a	Is the cup kept clean, off the floor and out of reach of students?	Yes	No
b	Is the drinking water storage container covered?	Yes	No
c	Does the drinking water storage container look clean?	Yes	No
d	Does the drinking water storage container have a narrow neck?	Yes	No
e	Are any of the following treatment equipment or supplies observed?	Multiple Response-Select all that apply Bleach/ Chlorination Piece of Cloth Water Filtering device Other filter (Ceramic, Sand, Composite) Other (Specify)	

7	If there are students with a disability or special needs, do they face any of the following barriers to getting drinking water without assistance?	<b>Multiple Response-Select all that apply</b> Distance to source Difficult terrain Lack of access features such as ramps Pump handles are hard to use Difficulty carrying or transporting container N/A Other (Specify)
8	Do the youngest students face any of the following barriers to getting drinking water without assistance?	<b>Multiple Response-Select all that apply</b> Distance to source Difficult terrain Lack of access features such as ramps Pump handles are hard to use Difficulty carrying or transporting container Other (Specify)

9	Can you show me how the school disposes of used water?	Yes	No	
a	What are the points of discharge of school's used water?	<b>Observe and Record:</b> <b>Take a picture</b> <b>Multiple Response-Select all that apply</b> Piped sewer Piped, don't know where Soak away/Cesspit/Septic system Sanitation facility Open channel Street surface Street ditch/gutter Space outside premises Water body (lake, river) etc. Premises yard or garden Other (Specify)		
b	Other observations about points of discharge of used water	<b>Observe and Record:</b> <b>Take a picture</b> <b>Multiple Response-Select all that apply</b> Stagnant water pool Swampy area Lots of insects/ Mosquito breeding Bad smell Signs of residues (soap, green slime) Other (Specify) None		
<b>B</b>	<b>Access to sanitation</b>			
10	Can you please show me the school toilets?	Yes	No	
11	What type of facilities exist? Select all that apply and record number of each type of facility	<b>Flush/Pour flush</b> Flush to septic tank Flush to pit latrine <b>PIT LATRINE</b> Ventilated Pit Latrine Pit Latrine with slab Pit latrine without slab/Open pit Composting toilet No Facility/Bush/Field Other (Specify)		
12	What are the conditions of these facilities? Select One	Fully functioning Partially functioning Not Functioning		
13	Do the students toilets/latrines provide privacy?	Yes	No	
a	Do you observe any of the following?	<b>Multiple Response-Select all that apply</b> Closable doors that lock from inside Holes or cracks Windows or low walls		
14	Do you observe any of the following adaptations for students with disabilities/special needs?	<b>Multiple Response-Select all that apply</b> Widened entrance Widened space for toilet facility Adapted door handles or closing mechanism		

		Built a ramp or sloping path Installed hand rails or grab bars Changed latrine design Use movable or adapted toilet seat Changed flooring material Other (Specify)	
15	Do you observe any of the following adaptations for the youngest students?	Smaller toilet hole Lower seat Lower door handles Other (Specify)	
a	Visible faecal residues on floor, wall or door	Yes	No
b	Visible used anal cleansing material (e.g. toilet paper)	Yes	No
c	Surface flow or sewage	Yes	No
d	The toilet smells bad	Yes	No
e	Does the latrine look like it is being used?	Yes	No
f	What is the main material of the walls of the latrine?	<b>Natural walls</b> Mud and sticks <b>Rudimentary walls</b> Mud bricks Plywood, re-used wood <b>Finished Walls</b> Cement/Stone blocks Bricks Wood plank Other (Specify)	
16	What type of flooring is there in the latrine?	earth / sand / mud wood planks brick ceramic tiles concrete other (specify)	
17	What type of roof does the latrine have?	thatch mats wood planks tarpaulin, plastic cloth zinc, metal, tin wood ceramic tiles concrete, cement stone no roof other (specify)	
18	What is the latrine door made of?	metal sheet mats cloth curtain wood no door other (specify)	
19	Does the latrine have a lid cover?	Yes	No
20	Is the latrine pan broken, choked, blocked due to debris, stone, leaves, mud ,	Yes	No

	paper, etc.?			
21	Does the latrine have a ventilation pipe?	Yes	No	
22	Is the outer tip of the ventilation pipe covered with a wire net or any material that has perforation/small holes that will prevent flies from entering/leaving the pit?	Yes	No	Don't Know
23	Is there a water storage container or tank in the latrine for anal cleansing or flushing?	Yes	No	N/A
24	Is the pit or septic tank covered?	Not covered Properly covered Cover doesn't fit well Direct pit latrine, doesn't need cover don't know does not have pit or septic tank		
<b>C</b>	<b>Access to Handwashing with Soap</b>			
25	Is there a place to wash hands?	Yes	No	
26	What type of handwashing facilities exist? Select all that apply and number of each type	Running water from a piped system or tank Hand-poured water system Bucket with a dipper and basin (handwashing done in the basin) Other (Specify)		
27	Is there water at the place of handwashing?	Yes	No	
28	Is there soap, detergent or other cleaning agent material?	Yes	No	
29	What are the conditions of these facilities	Fully functioning	Partially functioning	Not Functioning
30	Do you observe any of the following? Select all that apply	Clear path with no obstructions, steps or stairs Tap and soap are reachable from seated position Tap can be operated by feet and/or closed fist with minimal effort Height of tap and soap are appropriate for youngest students		
<b>D</b>	<b>Observe- Students WASH Practices</b>			
1	Do the pupils WASH hands after visiting the toilet?	Yes		No
	If Yes, how many pupils washed hands after visiting the toilet during break time?			
2	Did you observe pupils using the toilet			
	Did the pupils properly use the toilets?	No faeces on the floor		
		No urine on the floor		
	Did the pupils draw water from the safe water container?	Yes		No
	Do the pupils crowd at the drinking water source?	Yes		No

## **Appendix III: Key Informant Interview guides**

### **Key Informant Interview Guide: School Head Teachers**

#### **WASH facilities**

1. According to your experience, to what extent do children feel comfortable visiting WASH facilities? (*Prompt: easy access to the facilities, safety of the infrastructures etc.*)
  - a) What factors encourage students to use the school WASH facilities? (*Prompt: Cleanliness, possibility of interchange, preference in using schools' toilets rather the ones made available in the camp etc.*)
  - b) What makes the children reluctant to use the school WASH facilities? (*Prompt: Fear of being bullied by other children, lack of hygiene products, lack of cleanliness of the facility, non-suitability of the place for certain categories of students etc.*)
  - c) What could be done to increase the use of the school WASH facilities by the students? Please explain.

#### **Water provision**

2. In your opinion, is the amount of drinking water provided sufficient to meet students/teaching personal daily needs? Please explain.
3. Is the amount of water provided to the school for hygiene practices (washing hands, cleaning etc.) sufficient? Please explain.

#### **Hygiene products provision**

4. Do you consider that the number of hygiene-related products (soap, water jugs, etc.) provided to teachers and students is satisfying?
  - a In your experience, how often does the school WASH facilities run out of hygiene-related material?
  - b What can these shortages (if any) be attributed to? Please explain.
  - c How could these shortages (if any) be reduced?

#### **Cleaning and maintenance of the WASH facilities**

5. What are the management systems in place to keep the facilities in proper working and hygienic order? Please explain
  - a. In your opinion, could these management systems be improved? → If yes, in which ways?  
→ If no, what works with the current management practices?



### **Reporting process**

6. Is a complaint process established for students and/or education staff to report the issues they face as regard to the use of the WASH facilities in your school?
7. Did students ever complain to you regarding the WASH facilities in your school?
  - a. If yes, did you report the complaints?  
→ If yes, how did you report the complaints and to whom?  
→ If yes, were said complaints addressed?

### **Teacher Training**

8. Have you - or the teachers who work in your school - been trained on how to teach sanitation and hygiene to students?
  - a. If yes, who was providing the training and where?
  - b. If yes, was it a one-time training or is it conducted on regular basis (and if so, how often is this training provided to you/teacher)?

### **Child Education**

9. Are the WASH education programs taught to children gender specific?
  - a. Are they taught to boys/girls separately?
  - b. Do boys have access to the female curriculum and vice versa?
10. In your opinion, is the educational material easily applicable for students in their daily life both at school and outside of it? Please explain.

### **Student Behavior**

#### **Behavioral Practices at school**

11. In your opinion, to what extent are students encouraged to apply what they learn during sanitation and hygiene classes at the school?

To what extent do you think that students are actually putting what they learn during these classes into practice?

- a) To what extent are students encouraged to have a hygienic behavior? (*Prompt: Regular reminder of teacher of basic good hygienic behavior, peer-to-peer teaching, safe water clubs for WASH practices etc.*)

- b) What kinds of hygiene practices do kids have to comply with at school? (*Prompt: Wash hands before eating and after urinating with soap etc.*)

### **Behavioral Practices outside of school**

12. In your opinion, to what extent are children encouraged to have good hygiene practices outside of school?

- a) What initiatives are currently in place to promote good hygiene practices to children outside of school?
- Who are the actors behind these initiatives?
- According to you, what results have been achieved so far thanks to them? Please explain.
- b) In your opinion, could community involvement and encouragement of good hygiene practices be increased? If so, how? Please explain.
- c) In your opinion, could community involvement and encouragement of proper WASH facility use be increased?

### **Children with disabilities**

13. In your opinion, to what extent access to the school WASH facilities is limited for children with disabilities? Please explain.

- a) What kind of issues do children with disabilities face in accessing and using school WASH facilities?
- b) Could schools' facilities be improved to facilitate their use by children with disabilities?

14. In your opinion, to what extent is WASH facility access hindering children with disabilities school attendance?

- a. Besides from schools' facilities improvement, what type of initiatives could be implemented to prevent this? (*Prompt: Set up more awareness sessions, providing greater assistance to children with disabilities at school etc.*)

### **WASH sustainability**

15. What measures are in place to address the challenges mentioned above with regards to access to WASH
16. Do you receive any WASH funding? If Yes, from who? How much per term?

17. What is your termly budget on WASH infrastructure/ construction/ handwashing facilities/ safe water containers?
18. What is your termly budget on WASH operation and maintenance?
19. What can the County Government do to improve on access to WASH in ECD schools?

**Do you have any questions for us?**

## **Key Informant Interview Guide: County/ Sub County ECD Coordinators**

### **Background information**

1. How long have you worked as a County ECD coordinator? (Number of months/years)
2. Please describe your key roles and responsibilities?

### **County government support**

1. In your opinion, what are the underlying causes of health issues among young children? [WASH related]
2. How does the County/Sub- County support WASH activities in ECD schools in this region?
3. To your knowledge, has the Kisumu County integrated development plan factored in WASH activities in ECD schools? Y/N
4. If yes, which key areas have been captured?
5. Is there budget allocation for WASH in ECD schools at the county/sub county level?
6. What are the major challenges that hinder access to WASH in ECD schools?
7. How do you address the challenges mentioned above?
8. What Key measures has the department taken in ensuring improved access to WASH in schools?

**Do you have any questions for us?**

#### Appendix IV: Budget

Item description	Quantity	Units	Rate per unit	No. of days	Amount
<b>Equipment</b>					
Hire recorders	3	pieces	5,000	3	45000
<b>Personnel Allowances</b>					
Research assistants allowances	3	persons	1000	15	45000
KII Refreshments	162	Persons	50	1	8100
<b>Communication</b>					
Internet Bundles	3	pieces	1000	3	9000
Airtime	3	pieces	1000	3	9000
<b>Stationery</b>					
Notebooks	12	pieces	50	1	600
Pens	12	pieces	50	1	600
Pencils	12	pieces	50	1	600
Erasers	6	pieces	20	1	120
Folders	6	pieces	60	1	360
Files	6	pieces	100	1	600
<b>Travel Expenses</b>					
Ground Travel Expenses	3	persons	500	15	22500
Lunches	3	persons	500	15	22500
<b>Total</b>					<b>163980</b>

## Appendix V: Approval Letters



REPUBLIC OF KENYA

### MINISTRY OF EDUCATION State Department of Early Learning & Basic Education

Telegrams: "schooling", Kisumu  
Telephone: Kisumu 057 - 2024599  
Email: countyeducation.kisumu@gmail.com

COUNTY DIRECTOR OF EDUCATION  
KISUMU COUNTY  
PROVINCIAL HEADQUARTERS NYANZA  
3<sup>RD</sup> FLOOR  
P.O. BOX 575 – 40100  
KISUMU

When replying please quote

REF: CDE/KSM/GA/3/24/ IV/105

5<sup>th</sup> March, 2020

#### TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION  
ROSELYNE DIANA OKWIRI – NACOSTI/P/20/2723

The above named is from Maseno University

This is to certify that she has been granted authority to carry out research on *"Factors Influencing Uptake of Water, Sanitation and Hygiene Practices Amon Children in Early Childhood and Development Schools in Nyando Sub County, Kenya"* for the period ending **15<sup>th</sup> February, 2021..**

Any assistance accorded to her to accomplish the assignment will be highly appreciated.

EUNICE A. OUKO  
For: COUNTY DIRECTOR OF EDUCATION  
KISUMU COUNTY



COUNTY GOVERNMENT OF KISUMU

CECM OF EDUCATION, ICT AND HUMAN RESOURCE DEVELOPMENT

Ref: CGK/EX. ED/ICT&HRD/46/VOL.1

Date 6<sup>th</sup> March, 2020

TO WHOM IT MAY CONCERN

AUTHORITY TO UNDERTAKE RESEARCH IN EARLY CHILDHOOD  
DEVELOPMENT SCHOOLS IN NYANDO SUB - COUNTY: ROSELYNE  
DIANA OKWIRI: EL/ESM/00629/2014

This is to confirm that the student named above has been allowed to undertake her research in Nyando Sub County on factors influencing uptake of Water, Sanitation and Hygiene Practices among children in early childhood and development in schools. The research period will be 3 months from the date of this letter.

Any assistance given to her shall be appreciated.

A handwritten signature in blue ink, appearing to read 'Onyango Penina'.

Onyango Penina (Mrs)

CHIEF OFFICER EDUCATION AND ICT



Prosperity House (Former Nyanza Provincial Headquarters Building) 8<sup>th</sup> Floor  
P.O. Box 2738-40100Kisumu City  
E-mail: [kisumucounty@kenya.go.ke](mailto:kisumucounty@kenya.go.ke)



## MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

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Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya  
Email: [muerc-secretariate@maseno.ac.ke](mailto:muerc-secretariate@maseno.ac.ke)

**FROM:** Secretary - MUERC

**DATE:** 23<sup>rd</sup> January, 2020

**TO:** Roseline Diana Okwiri  
EL/ESM/00629/2014  
Department of Public Health  
School of Public Health and Community Development  
Maseno University  
P. O. Box, Private Bag, Maseno, Kenya

**REF:** MSU/DRPI/MUERC/00782/19

**RE: Factors Influencing Uptake of Water, Sanitation and Hygiene Practices among Children in Early Childhood and Development Schools in Nyando Sub County, Kenya. Proposal Reference Number MSU/DRPI/MUERC/00782/19**

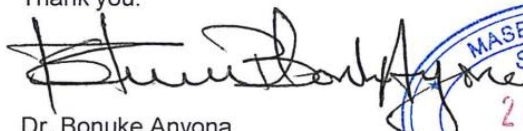
This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 23<sup>rd</sup> day of January, 2020 for a period of one (1) year. This is subject to getting approvals from NACOSTI and other relevant authorities.

Please note that authorization to conduct this study will automatically expire on 22<sup>nd</sup> January, 2021. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 15<sup>th</sup> November, 2020.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 15<sup>th</sup> November, 2020.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advise MUERC when the study is completed or discontinued.

Thank you.



Dr. Bonuke Anyona,  
Secretary,  
Maseno University Ethics Review Committee



Cc: Chairman,  
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 9001:2008 CERTIFIED





## THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone: Kisumu 2022219/Fax: 2022219  
Email: ckisumucounty@gmail.com

COUNTY COMMISSIONER  
KISUMU COUNTY  
P.O. BOX 1912-40100  
KISUMU

Ref: CC/KC/ R.ES/1/VOL IV/ (30

Date: 5<sup>th</sup> March, 2020

Deputy County Commissioner  
NYANDO SUB COUNTY

### RESEARCH AUTHORIZATION: ROSYLINE DINAH OKWIRI

Reference is made to a letter from the National Commission for Science, Technology and Innovation No. NACOSTI/P/20/2723 of 5<sup>th</sup> March 2020 on the above subject.

The above named is a student of Maseno University. She has been licensed to carry out a research on "**Factors influencing uptake of water, sanitation and hygiene practices among children in early childhood and development schools in Nyando sub County**".

Kindly accord her any assistance that she may need.

R. NYAKWARA  
FOR: COUNTY COMMISSIONER  
KISUMU COUNTY

Copy to:

Rosyline Dinah Okwiri  
MASENO UNIVERSITY



## Appendix IV: Research License

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 967482	Date of Issue: 15/February/2020
<b>RESEARCH LICENSE</b>	
	
<b>This is to Certify that Ms.. Roselyne Diana Okwiri of Maseno University, has been licensed to conduct research in Kisumu on the topic: FACTORS INFLUENCING UPTAKE OF WATER, SANITATION AND HYGIENE PRACTICES AMONG CHILDREN IN EARLY CHILDHOOD AND DEVELOPMENT SCHOOLS IN NYANDO SUB COUNTY, KENYA for the period ending : 15/February/2021.</b>	
License No: NACOSTI/P/20/2723	
Applicant Identification Number <b>967482</b>	
Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
Verification QR Code	
	
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