WATER, SANITATION AND HYGIENE AS AN INTERVENTION FOR STIGMATIZATION AMONG PEOPLE LIVING WITH HIV/AIDS IN RONGO SUBCOUNTY, MIGORI COUNTY

Meshack Malenya Wafula, Dr. Daniel Mokaya and Elizabeth Mitaki

IPRJB

INTERNATIONAL PEER REVIEWED
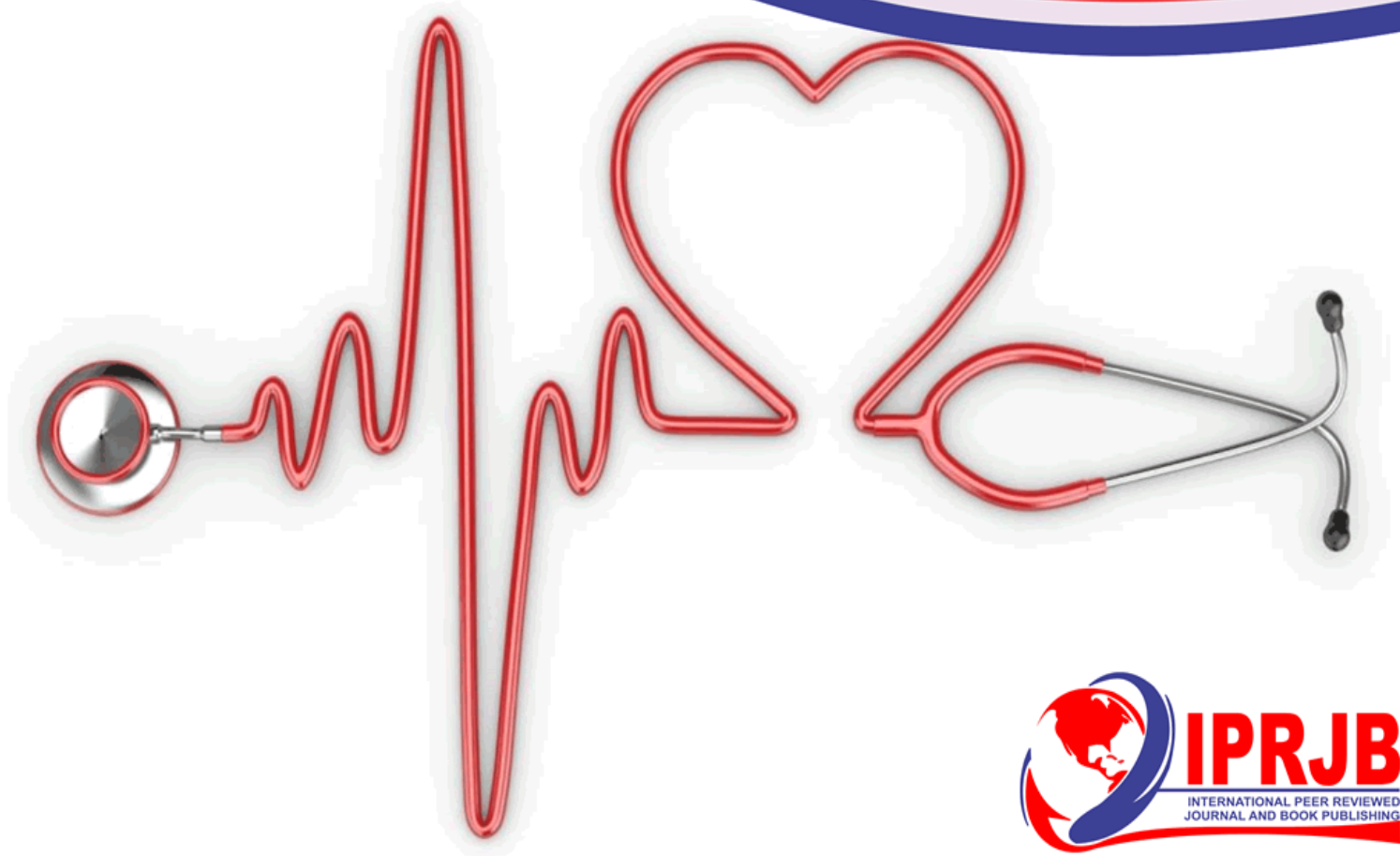JOURNAL AND BOOK PUBLISHING

WATER, SANITATION AND HYGIENE AS AN INTERVENTION FOR STIGMATIZATION AMONG PEOPLE LIVING WITH HIV/AIDS IN RONGO SUBCOUNTY, MIGORI COUNTY

[1*]Meshack Malenya Wafula

[1]Post Graduate Student: Jomo Kenyatta University of Agriculture and Technology

*Corresponding Author's Email: meshmalenya@gmail.com

[2]Dr. Daniel Mokaya

Lecturer: Jomo Kenyatta University of Agriculture and Technology

[3]Elizabeth Mitaki

Lecturer: Jomo Kenyatta University of Agriculture and Technology

Abstract

Purpose: The purpose of the study was to examine WASH outcomes as an intervention for stigmatization towards PLWHIV among residents of Rongo subcounty

Methods: The study employed descriptive cross sectional. The study population comprised of PLHIV at household level randomly selected from North Kamagambo, WASH Intervention arm and non-WASH compliances HH was determined for the their health outcomes. A sample size of 193 study subjects was drawn from the target population. Qualitative and Quantitative data collection methods and tools were used during the study. Qualitative techniques included Questionnaires, Focus group discussion, direct observation and key information interview thorough telephone and face to face interviews. Quantitative data was obtained from the existing public health and medical records and the data was analyzed using Statistical Package for Social Sciences (SPSS) computer program version 24.0.A T-test was used to test the hypothesis on the two dependent groups exposed to different interventions.

Results: Study findings indicate that on the demographic information, marital status, age and occupation showed a positive effect on the WASH outcomes on the HIV patients except the gender of the patients (β=-1.440, df=1, p=0.086), (β=0.779, df=1, p=0.046), (β=0.020, df=1, p=0.530), and (β=0.196, df=1, p=0.443), respectively. On the WASH interventions, safe disposal of faeces, menstrual waste management and adherence to ART having a positive effect on the WASH outcomes on the HIV patients except access to drinking water with (β=19.924, df=1, p=0.000), (β=21.420, df=1, p=0.009), (β=19.295, df=1, p=0.019) and (β=-0.625, df=1, p=0.002). The WASH interventions indicated all the WASH initiatives having a statistical significant effect on the WASH outcomes on the HIV patients. On the Community-based health promotion and preventive interventions, Financial interventions and community mobilization indicated a negative effect on the WASH outcomes on the HIV patients (β=-0.002, df=1,p=0.050) and (β=-1.128, df=1,p=0.018) respectively. Referral to a health facility, vector control and education and training having a positive effect on the WASH outcomes on the HIV patients (β=1.350, df=1,p=0.051), (β=-0.019, df=1,p=0.978) and (β=20.306, df=1,p=0.999) respectively. This indicated that the financial interventions and community mobilization statistically significant in the model.

Unique contribution to theory, practice and policy: The study recommends that HIV-positive women and their caregivers must prevent HIV transmission from menstrual blood by practicing universal precautions.

Key words: *Water, Sanitation and Hygiene , Stigmatization, Hiv/Aids Migori County*

1.0 INTRODUCTION

Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome is a major development challenge in Migori County. The county has an HIV/AIDS prevalence of about 14.7% compared to the national average of about 5.9% (*KHIS 2016).* Stigma against HIV and AIDS is a hidden epidemic that is as large as, or even larger than the HIV epidemic itself. PLHIV face different types of discrimination that affect housing, employment, social interactions, childcare, and access to medical services, water and sanitation (*Magrath , Tesfu, 2006*).

The high prevalence is as the result of retrogressive cultural practices of wife inheritance, multiplicity of partners, alcohol and drug abuse. Rongo sub county has relatively low and inadequate water supply (NASCOP 2014)

Although the WASH needs of PLHIV are greater than those without HIV, PLHIV often have less access to water and sanitation facilities than their neighbour's because of sickness or discrimination. PLHIV and their families have been subjected to discrimination if a person's HIV status is known; for example, sometimes PLHIV are refused the right to use communal latrines because users fear that HIV can be transmitted through latrines (OSSA/Bahir Dar, 2009). Approximately 90 per cent of the households do not have access to adequate clean water. The only reliable water sources are sub surface water which are mostly contaminated.(KDHS, KNBS, 2009)

Diarrhea is one of the common illnesses affecting people living with HIV (PLHIV) and yet we also know that it is one of the diseases for which proper hygiene and sanitation practices can reduce morbidity and mortality. While evidence shows that poor hygiene affects the HIV infected more as it increases susceptibility to opportunistic infections, WASH provides a value neutral subject that eases community entry and forms a neutral platform through which both the infected and affected address hygiene and HIV without stigmatization (A.Macinyre, H.Meke, 2013).

There is lack of research on WASH and HIV integrated programs, thus far, the disease has been treated as an epidemic and not considered as a chronic or socio-economic problem. Neither international organization nor country government have looked closely at the implication and potential contribution of WASH in combating the disease and a remarkably small amount of academic research has been done on the subject. A nearby and reliable supply of water, including small scale production of and sanitary latrines allows those infected by HIV/AIDS to continue productive activities and reduce the workload for caregivers.

The high HIV prevalence rate continues to impact negatively on the county's development besides placing a lot of strain on any household budget. In attempting to treat the opportunistic infections associated with HIV and AIDS, resources which could be put to better uses are lost. HIV/AIDS has also affected productivity especially in agricultural and transition in the education sector. In schools as in farms, lots of productive hours are lost by teachers and learners seeking care and support. In agriculture the consequence has been food insecurity as result of low agriculture activities occasioned by resources being diverted to combat the scourge. Socially, the county has a huge burden of care for a large number of orphans; widows and widower as both parents and spouses continue suffer due to HIV/AIDS. The fight against HIV/AIDS must therefore be intensified if the county is to win its war against poverty (KAIS, 2014).

1.1 Statement of the problem

According to UNICEF, in rural Kenya, only 29% of households report use of an improved sanitation facility and 54% of households report use of an improved drinking water source *(UNICEF, 2013)*. Stigma has been identified as one of the biggest barriers to access to and success of HIV care and treatment. In counties like Migori that has one of the highest HIV prevalence rates in the county (4th nationally at 14.7%); the negative effect of stigma on HIV cannot be gainsaid. It fuels new infections and undermines treatment efficacy.

Stigma against PLHIV is a hidden epidemic that is as large as, or even larger than the HIV epidemic itself. PLHIV face different types of discrimination that affect housing, employment, social interactions, childcare, and access to medical services, water and sanitation (Magrath, Tesfu, 2006).

2.0 LITERATURE REVIEW

2.1 Water Sanitation and Hygiene

Worldwide more than 34 million people are living with HIV/AIDS, (WHO 2014,) to add to the challenge, a great many PLHIV live in region where access to WASH is limited .(Hutton, Bartrum,2011). Lack of WASH is linked to some of the leading causes of morbidity and mortality among PLHIV. 50% of PLHIV in North America and up to 100% PLHIV in the developing world suffer from diarrheal diseases often caused by poor sanitation, not only are PLHIV at greater risk for diarrheal disease but they generally suffer from it more frequently, have more severe episodes and are more likely to die from it (Stark, 2009).

Research in Uganda indicated that the presence of a latrine in the family compound was associated with fewer episodes of diarrhea, fewer days with diarrhea, and fewer days of work or school lost due to diarrhea in PLHIV (Lule, 2005*). PLHIV need more than average amount of water for day to day living. A study in Ngamiland, Botswana found that caregivers with HIV patients suffering from diarrheal diseases need an average of 20litres more per day to wash soiled clothes and sheets as well as sterilize contaminated areas (Ngwenya & Gathi, 2006).

Moreover, PLHIV are more susceptible to contracting diarrhea when fecal matter is present in the environment. Additionally, in the case of chronic diarrhea, maintaining a feces-free home can be difficult. New approaches and renewed vigilance may be required to keep the home clean. For example, promoting portable potties/buckets, developing washable mats, or placing a cloth that can easily be washed over straw beds will help reduce exposure to pathogens from diarrhea. Safe feces handling and disposal has been shown to reduce the risk of diarrheal disease by 30 percent or more (Fewtrell et al. 2005).

There is lack of research on WASH and HIV integrated programs, thus far, the disease has been treated as an epidemic and not considered as a chronic or socio-economic problem. Neither international organization nor country government have looked closely at the implication and potential contribution of WASH in combating the disease and a remarkably small amount of academic research has been done on the subject. A nearby and reliable supply of water, including small scale production of and sanitary latrines allows those infected by HIV/AIDS to continue productive activities and reduce the workload for caregivers.

The district has relatively low and inadequate water supply.The only reliable water sources are sub surface water which are mostly contaminated and this has aggravated the cases of water borne diseases like cholera, typhoid and bilharzia.The uniqueness of this area is to be

found in the high prevalence rate of HIV which is   triple the national average. Such high rates of prevalence continue to confound individuals and organizations working to eliminate the scourge

There is lack of research on WASH and HIV integrated programs, thus far, the HIV/AIDS has been treated as an epidemic and not considered as a chronic or socio-economic problem. Neither international organization nor country government have looked closely at the implication and potential contribution of WASH in combating the disease. A nearby and reliable supply of water, including small scale production of and sanitary latrines allows those infected by HIV/AIDS to continue productive activities and reduce the workload for caregivers.

2.2 Psychosocial Support in reducing Stigma among People Living with HIV

The HIV/AIDS pandemic has evoked a wide range of reaction from individuals, communities and even nations from sympathy and caring to silence, denial, fear, anger and violence. Stigma is an important factor in the type and magnitude of the reaction to this epidemics (*Malcolm et al.., 1997).* Research has shown that AIDS stigma can have a variety of negative effects on HIV test seeking behavior, willingness to disclose HIV status, health seeking behaviors, quality of health care, and social support solicited and received (*Cameron, 2000)*

Literature on caregiver shows that fear of contagious and fear for death have a clear negative effects on health care worker's attitude towards and treatment of PLHIV (*UNAIDS 2000).* In many developing countries , women are already economically, culturally and socially disadvantaged and lack equal access to treatment, financial support and education, Being outside the structure of power and decision making, they may be denied the opportunity to participate equally within the community and may be subjected to punitive laws, norms and practices exercising control over their bodies and sexual relations, this provides a fertile basis for further stigmatization of women within the context of HIV/AIDS *(Mugoya, GC Emst, K.2014)*

PLHIV in unhygienic condition can suffer from a condition called enteropathy, which hinders proper absorption of antiretroviral medicines and makes them less effective and in some cases leading to drug resistance (Prendergast and Kelly, 2012).With increasing availability of antiretroviral therapies (ART), more people live with HIV and AIDS and require comprehensive care, treatment, and preventative services to help boost their resilience to the endemic conditions in their environment and help them live longer and healthier lives. Recognizing the importance of safe water, sanitation, and hygiene promotion in protecting and caring for PLHIV, the trend is to integrate WASH improvement into HIV and AIDS policies and programs (Verose, Macinyre and Meke 2013)

When people lack access to a range of basic sanitation options, simple efforts, like safe handling and disposal of feces, can have significant positive health implications. An average person produces about 150 grams of feces per day, and open defecation around the world results in enormous volumes of human excreta deposited in and around communities, creating an infectious disease environment for HIV-affected households *(UN 2008)*

2.3 WASH integration in HIV management

Hygiene improvement is a comprehensive approach to reducing diarrheal disease by promoting improvements in key hygiene practices (hand washing, treatment and safe storage of water, and sanitation/feces management), improving access to safe water and sanitation technologies and products, and facilitating or supporting an enabling environment (improved policies, community organization, institutional strengthening, and public-private partnerships

(Fewtrell et al. 2005). Promoting these practices can prolong life and improve the quality of life for PLWHA and can also protect family members and caregivers from contracting diarrhea. In the later stages of AIDS, diarrhea becomes increasingly severe and persistent. (Curtis & Cairncross, 2003).

Hygiene, disease and menstrual blood in HIV-infected women are not discussed in the literature; only the grey (unpublished) literature and anecdotal conversations between scientists and program managers have covered this topic. Before antiretroviral therapy (ART) became prevalent, women often stopped menstruating once HIV had advanced. However, now that ART is widely used even in resource-poor countries, women continue to menstruate, which poses a hygiene challenge and possible risk of HIV transmission to caregivers. Menstrual blood of HIV-positive women contains the virus, sometimes at a higher load than regular blood (Reichelderfer et al., 2000).

Thus, HIV-positive women and their caregivers must prevent HIV transmission from menstrual blood by practicing universal precautions. Diarrhea, a very common symptom of HIV and AIDS, affects 90 percent of PLWHA and results in significant morbidity and mortality (Katabira 1999; Monkemuller and Wilcox 2000). Research on co-infection of diarrhea and HIV and AIDS shows that morbidity and mortality due to diarrheal disease is even more severe in children with HIV and AIDS. A study of HIV-positive infants in the Democratic Republic of Congo found that the risk of dying from diarrhea is 11 times greater than for infants who were HIV-negative (Thea *et al*. 1993).

Another study found that although common diarrhea-causing enteric pathogens are present in many babies, HIV Positive babies with acute diarrhea were six times more likely to develop persistent diarrhea. HIV-negative babies born to HIV-positive mothers were also at 3.5 time's greater risk of developing recurrent bouts of diarrhea than babies born to HIV-negative mothers (Keuch *et al*. 1992).

3.0 METHODOLOGY

The study employed descriptive cross sectional. The study population comprised of PLHIV at household level randomly selected from North Kamagambo, WASH Intervention arm and non-WASH compliances HH was determined for the their health outcomes. A sample size of 193 study subjects was drawn from the target population. Qualitative and Quantitative data collection methods and tools were used during the study. Qualitative techniques included Questionnaires, Focus group discussion, direct observation and key information interview thorough telephone and face to face interviews. Quantitative data was obtained from the existing public health and medical records and the data was analyzed using Statistical Package for Social Sciences (SPSS) computer program version 24.0.A T-test was used to test the hypothesis on the two dependent groups exposed to different interventions.
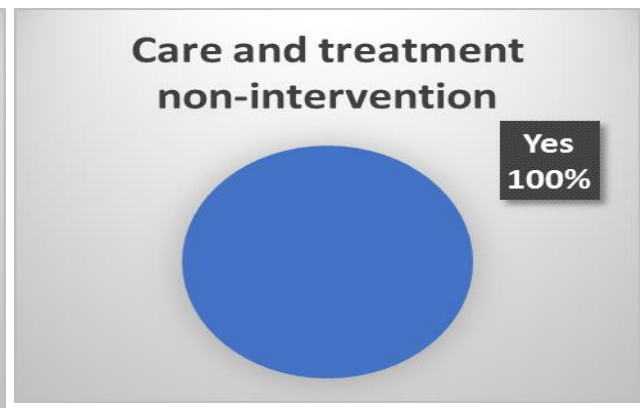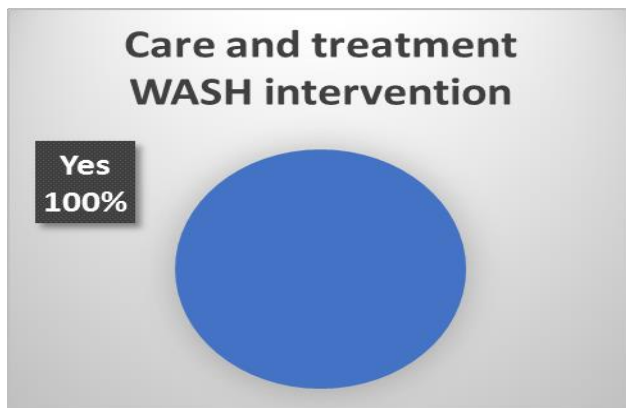
4.0 RESULTS

4.1 Stigmatization And Adherence

4.1.1 Tested and Knowledge on HIV

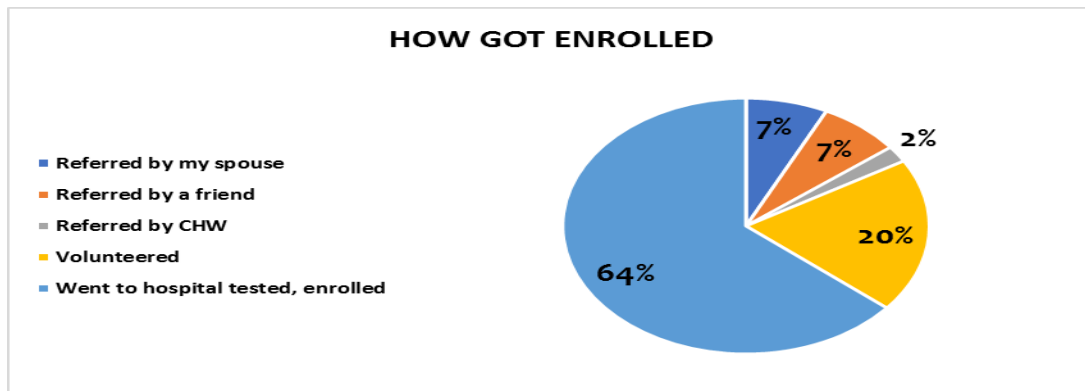All of the interviewee from both WASH intervention and non-intervention group sets agreed to know their status.
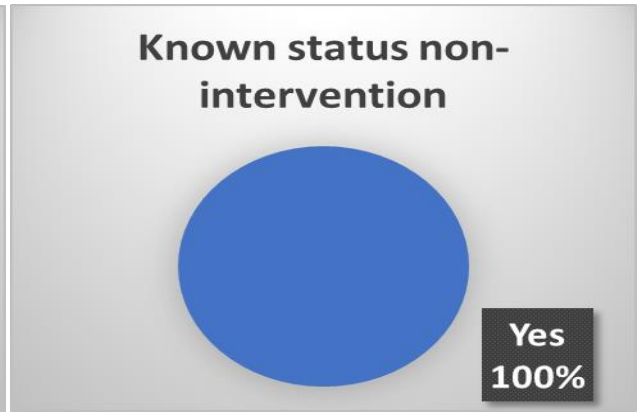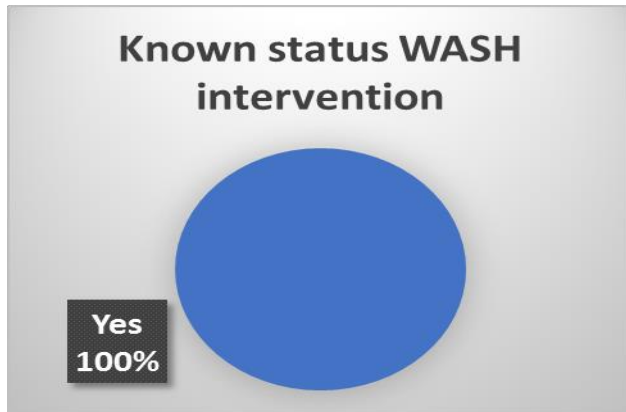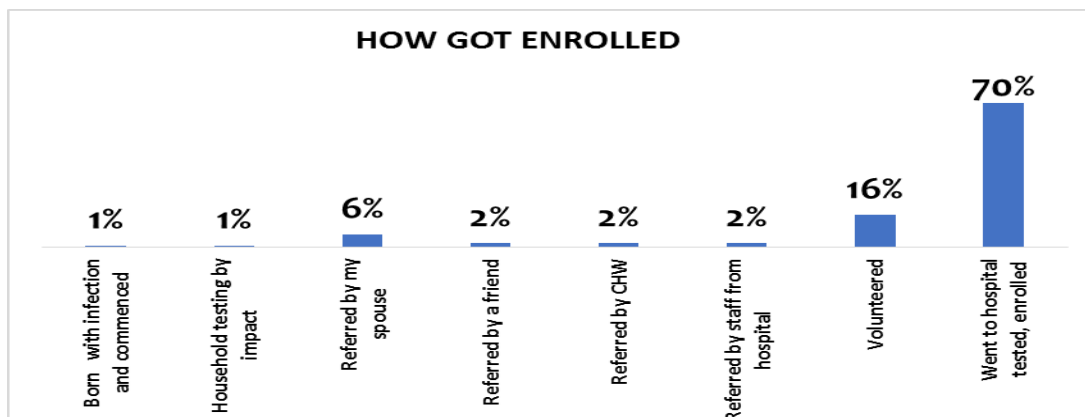
Care and treatment <GOOD>

All of the respondents were enrolled in the HIV program.

4.1.2 Methods of enrolment
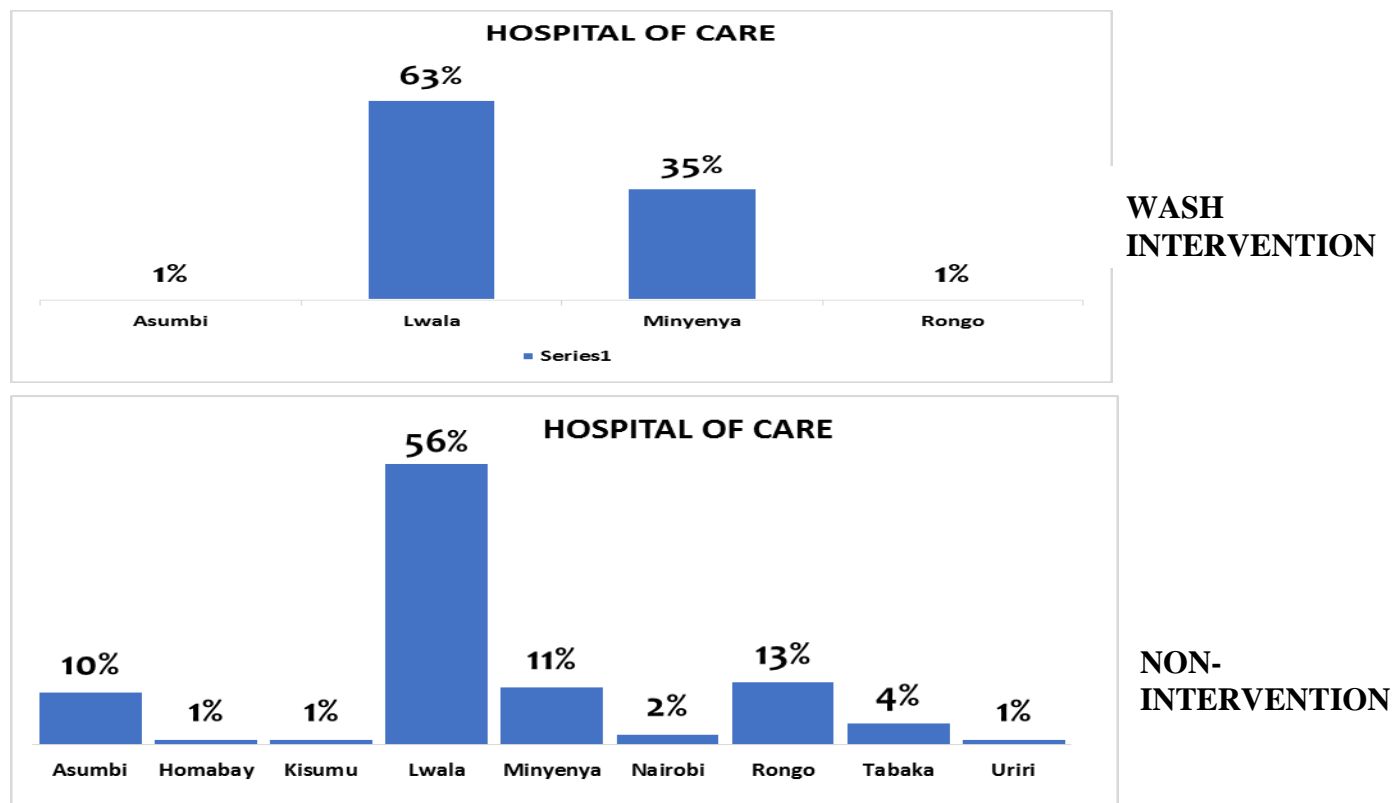

WASH INTERVENTION

NON-INTERVENTION

On WASH intervention, 64% (n=62) underwent HIV static testing approach where they went to the hospital, tested and enrolled. On the other hand, 20% (n=19) volunteered for the test, with 7% (n=7) referred to by spouse and friend respectively. Lastly, 2% (n=2) were referred by CHW.

On Non-intervention, on how enrolled, 70% (n=67) of the respondents went to the hospital, tested and enrolled when seeking medical attention, followed by 16% (n=15) who volunteered to be tested. This followed by 6% (n=6) of the respondents being referred by a spouse, referred by a friend, referred by CHW and referred by a staff from hospital respectively. The least indicated born with an infection and commenced and household testing by impact at 1% (n=1).

4.1.3 Hospital of enrollment

On Wash intervention, preferred health facility for most of the respondents was Lwala HC which indicated 63% (n=61), followed by Minyenya HC at 35% (n=34) with Asumbi HC and Rongo Hospital having the least at 1% (n=1).

Non-intervention, Lwala HC topped as most of the respondents'' preferred choice of health facility with 56% (n=54), 13% (n=12) from Rongo, 11% (n=11) from Minyenya, 10% (n=10) from Asumbi. Also, 4% (n=4) came from Tabaka, 2% (n=2) coming from Nairobi. The least hospitals of concern showing 1% (n=1) from Homabay, Kisumu and Uriri hospitals respectively.

## 4.1.4 Number of times
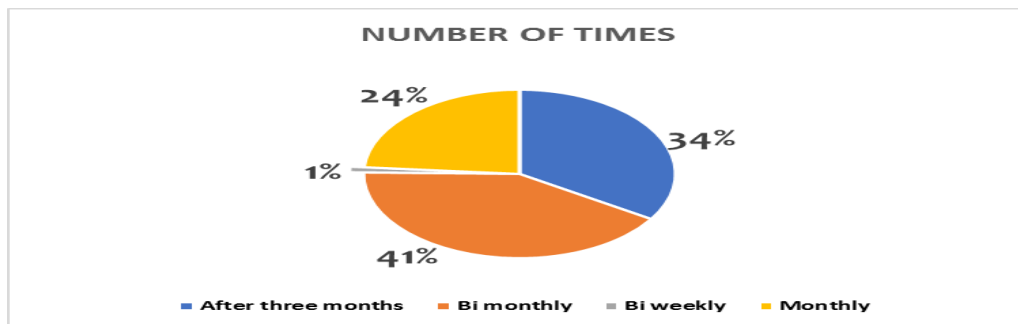
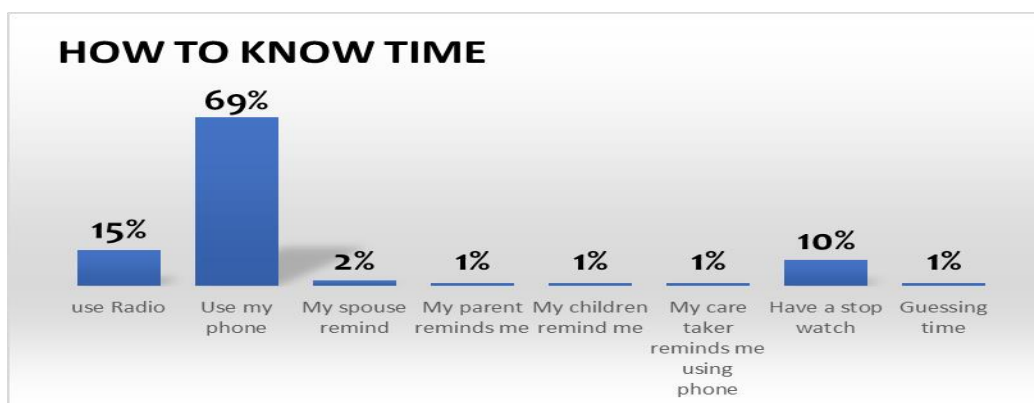**WASH INTERVENTION**
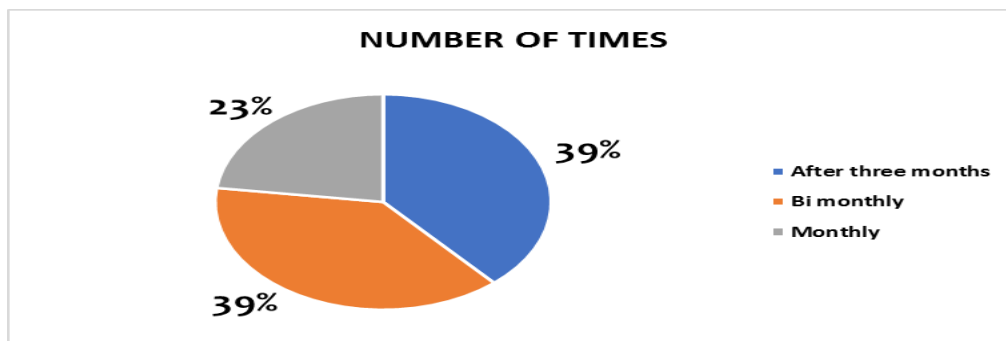
NON-INTERVENTION

On WASH intervention, when asked how often they take their medication, the majority of WASH intervention group 41% (n=40) showed Bi-monthly, followed by 34% (n=33) after three months, 24% (n=23) monthly with 1% (n=1) Bi-weekly.

On Non-intervention, on how often, 39% (n=37) showed both after three months and same figure 39% (n=37) were in for Bi monthly with monthly the least in terms of frequency at 23% (n=22).

4.1.5 How to know time
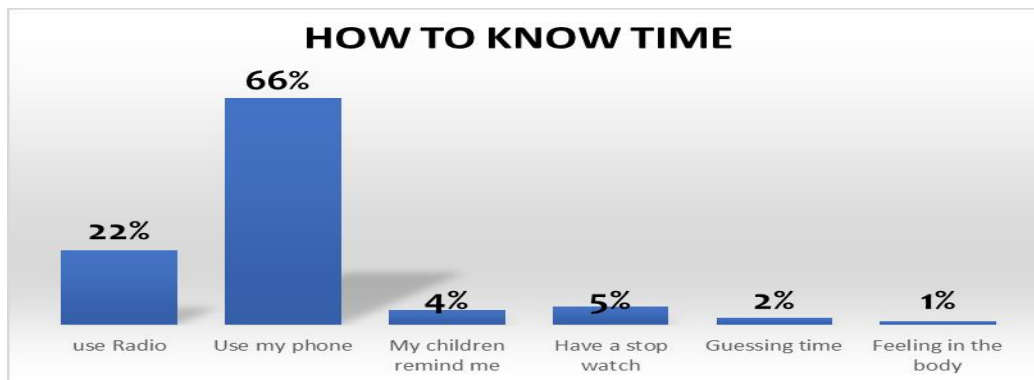
WASH INTERVENTION

NON-INTERVENTION

On WASH intervention, the majority of the respondents 66% (n=64) used their phones, followed by 22% (n=21) using the radio, followed by 5% (n=5) using a stopwatch. Those reminded by their children showed 4% (n=4), guessing at 2% (n=2) with the least at 1% (n=1) feeling in the body.

For Non-intervention, 69% (n=66) used their phones, 15% (n=14) use radio, 10% (n=10) having a stopwatch, 2% (n=2) relied on their spouse to remind them. Furthermore, 1% (n=1) guessed time, using the care taker to remind them through their phones, use their children to remind them and use their parents to remind them respectively.

4.1.6 Know drugs
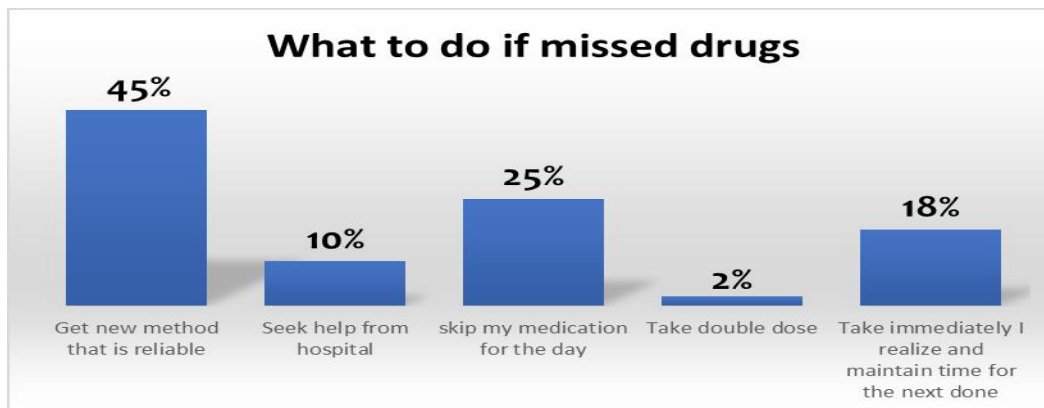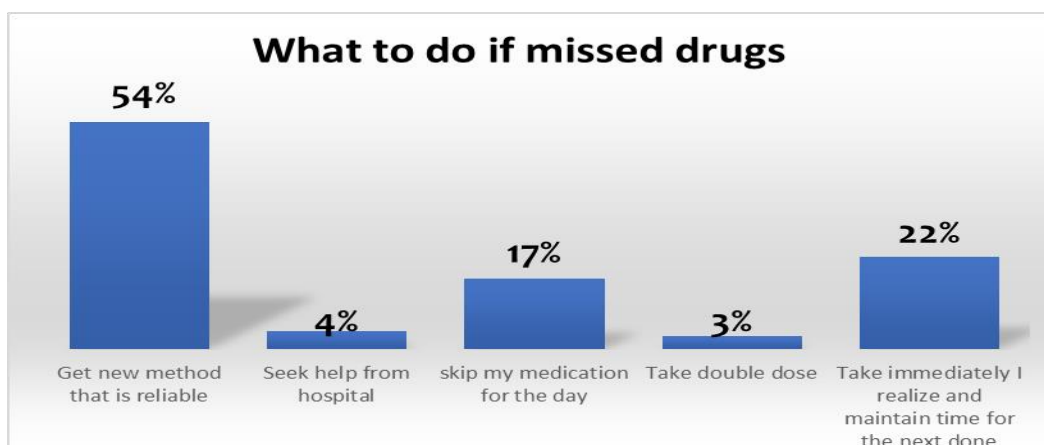
On WASH intervention, 45% (n=44) indicated getting new method that is reliable, 25% (n=24) showing skipping medicine for the day, 18% (n=17) take immediately the person realizes and maintains time for the next dose with 10% (n=10) and a further 2% (n=2) taking a double dose.

On Non-Intervention, On knowing drugs, 54% (n=52) recommended getting new method that is reliable, 22% (n=21) taking immediately they realize and maintain time for the next dose, 17% (n=16) skip medication for the day, 4% (n=4) seeking help from hospital and 3% (n=3) taking double dose.
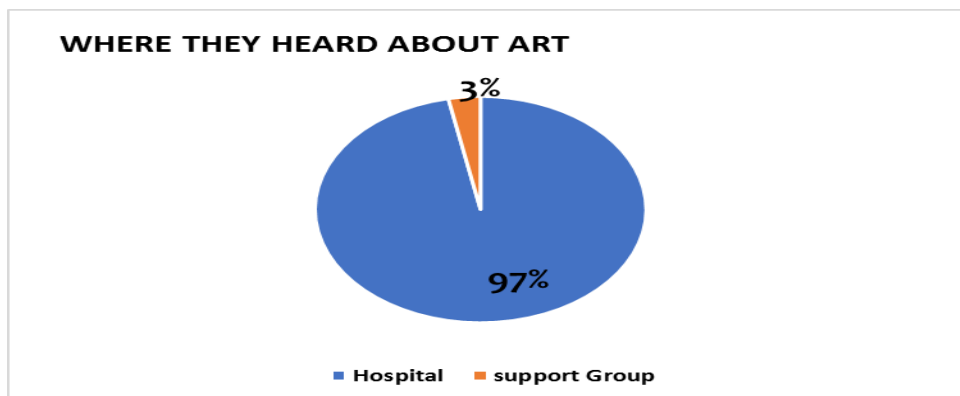
Know about ART <good>

The respondents were asked if they had knowledge of ARV drugs and all of the interviewees from both the WASH intervention and non-interventions agreed to have knowledge of ARV drugs.

The respondents were also asked if they knew the type of ARV drugs they were on and from the WASH intervention group,

4.1.7 Where heard about ART
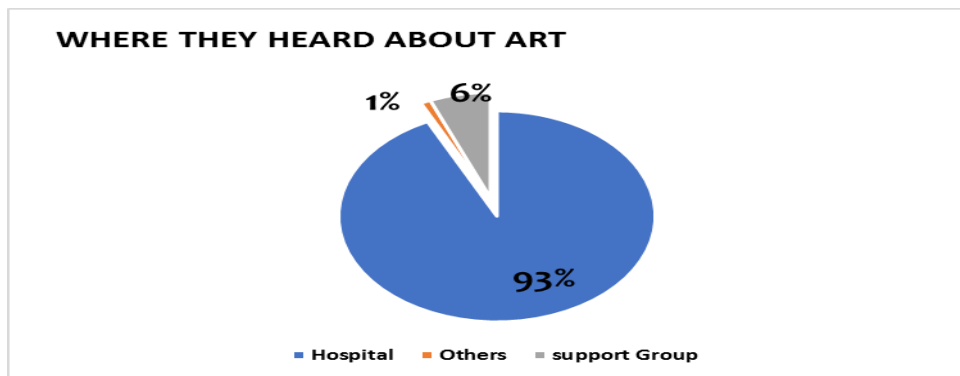
WASH INTERVENTION

NON-INTERVENTION

From WASH intervention, 93% of the respondents stated they heard about ART from the hospitals, 6% (n=6) from a support group with 1% (n=1) obtained from others.
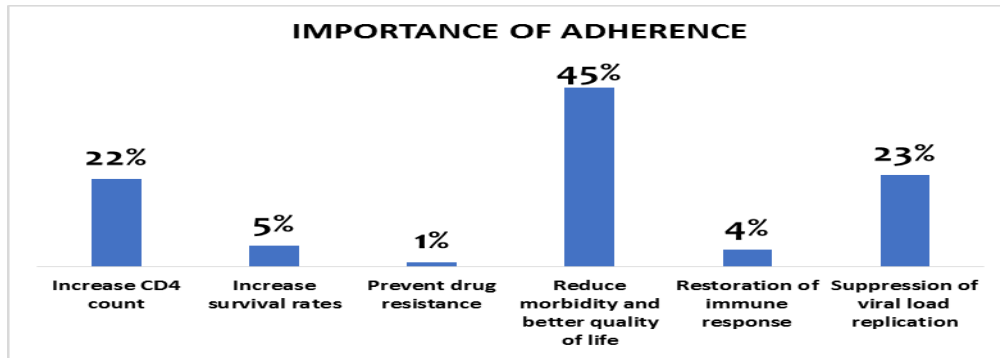
On Non-interventions, 95.9% (n=93) of the respondents indicated they heard about ART from a hospital with 3.1% (n=3) showing support group.

4.2 Importance of adherence
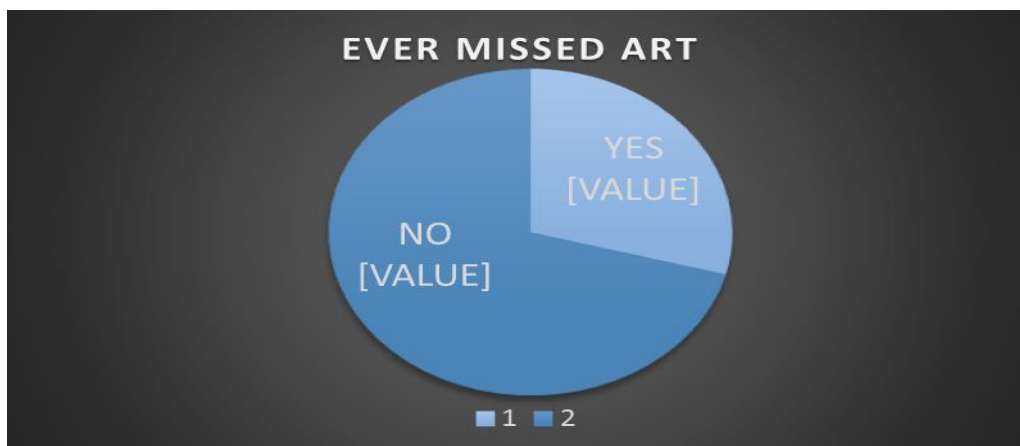
4.2.1 Wash-Intervention
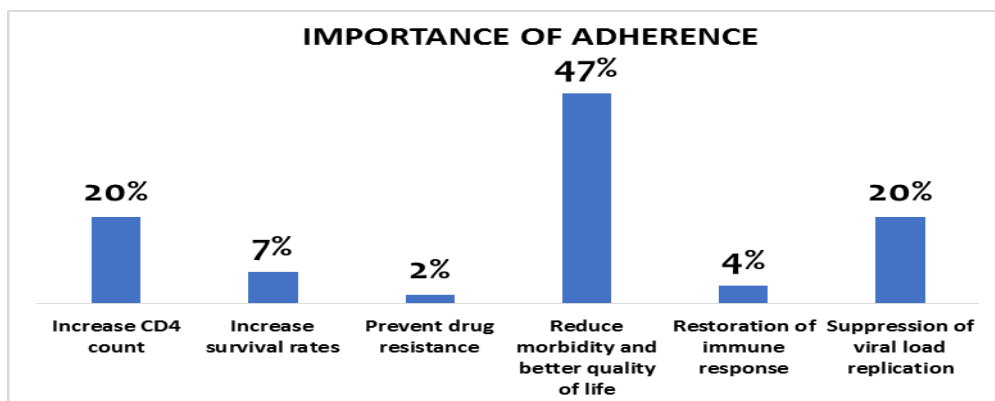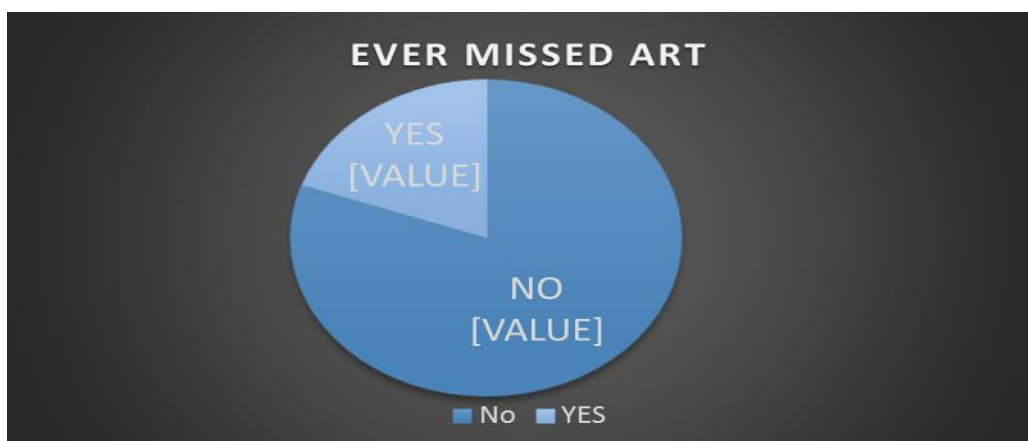

NON-INTERVENTION

On WASH intervention, On importance of adherence, 47% (n=46) reduced morbidity and better-quality life, 20% (n=19) increase in CD4 count and suppressing the viral load replication respectively. Later, 7% (n=7) increase in survival rates, 4% (n=4) restoration of immune response with 2% (n=2) on prevention of drug resistance.

On non-intervention, On the importance of adherence, 45% (n=43) showed reduced morbidity and better quality of life, 23% (n=22) suppression of viral load replication, 22% (n=21) increase CD4 count, 5% (n=5) increase survival rates, 4% (n=4) restoration of immune response with 1% (n=1) prevent drug resistance.

4.2.2 Ever missed ART?

On the question trying to asses, the respondents missed their antiretroviral drugs? From the **WASH intervention**? 80% (n=78) said they had never missed their drugs while 20 % (n=19) agreed to the fact that they have missed their drugs. On **Non-intervention**, 71% (n=68) responded to having not missed the ART with 29% (n=28) agree to have missed the medication.

4.2.3 Reason for missing
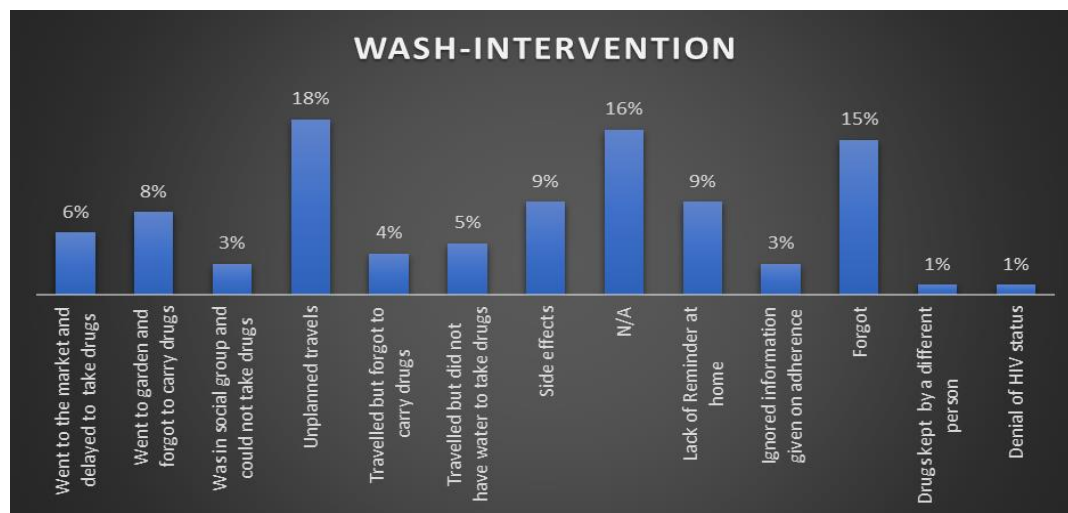
WASH INTERVENTION
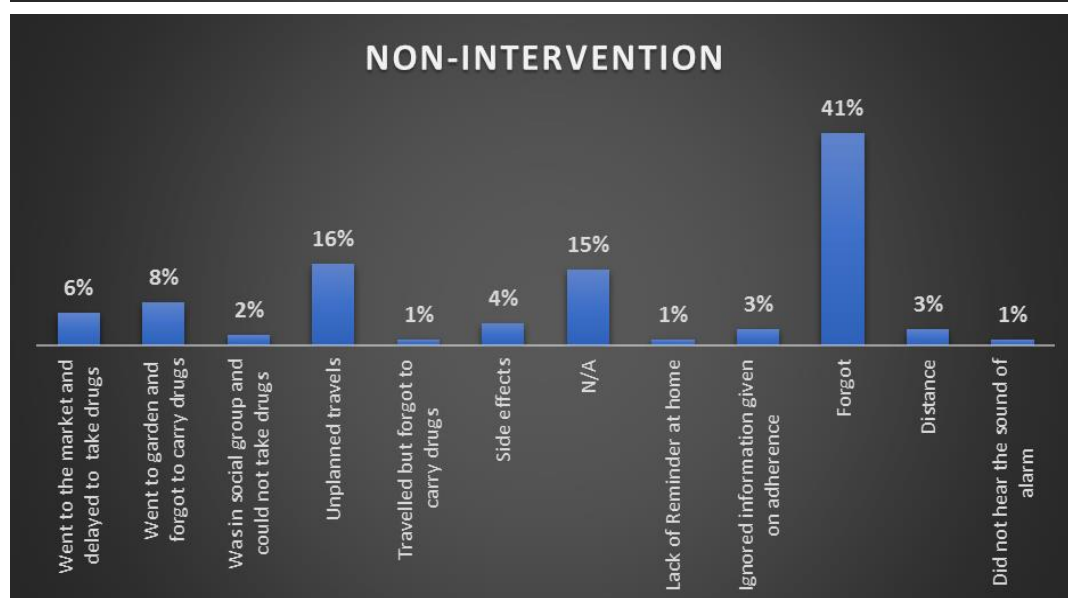
NON-INTERVENTION

For WASH intervention, On reasons for missing, 15% (n=15) forgot, 18% (n=17) unplanned travels, 8% (n=8) went to the garden and forgot to carry the drugs, 6% (n=6) went to the market and delayed to take the drugs, 9% (n=9), side effects, 5% (n=5) travelled but did not have water to take the drugs, 3% (n=3) was in social group and could not take drugs, 3% (n=3) ignored information given on adherence, lack of reminder at home, denial of HIV status, drugs kept by another person and traveled but forgot to carry the drugs.

On non-intervention, On the reasons for missing, 41% (n=39) forgot, followed by 16% (n=15) unplanned travels, 8% (n=8) went to garden and forgot to carry drugs, 6% (n=6) went to the market and delayed to take drugs, 4% (n=4) side effects, 3% (n=3) distance, 3% (n=3) ignored information given on adherence. Lastly, 1% (n=1) was in the social group and would not take drugs, lack of reminder at home and did not hear the sound of the alarm respectively.
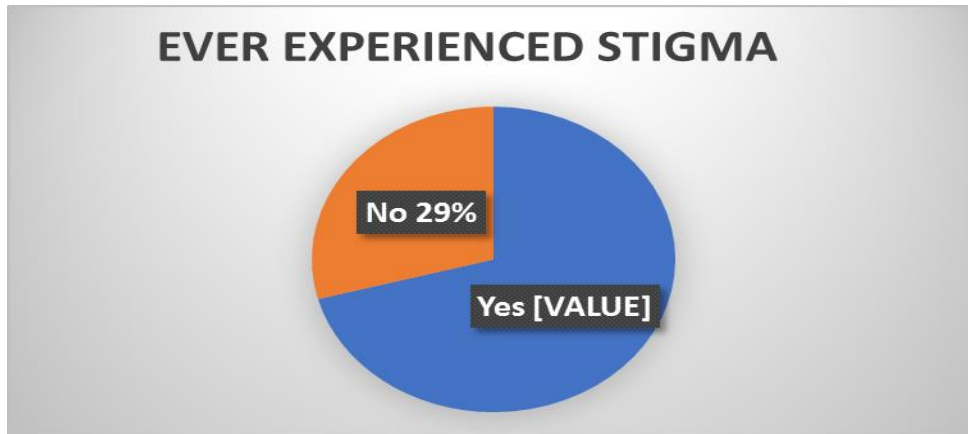
4.2.4 Community barriers
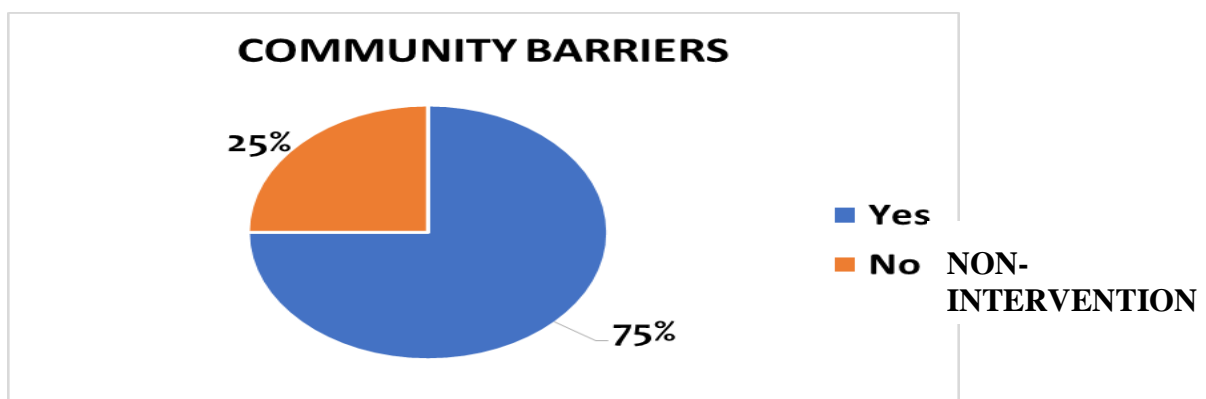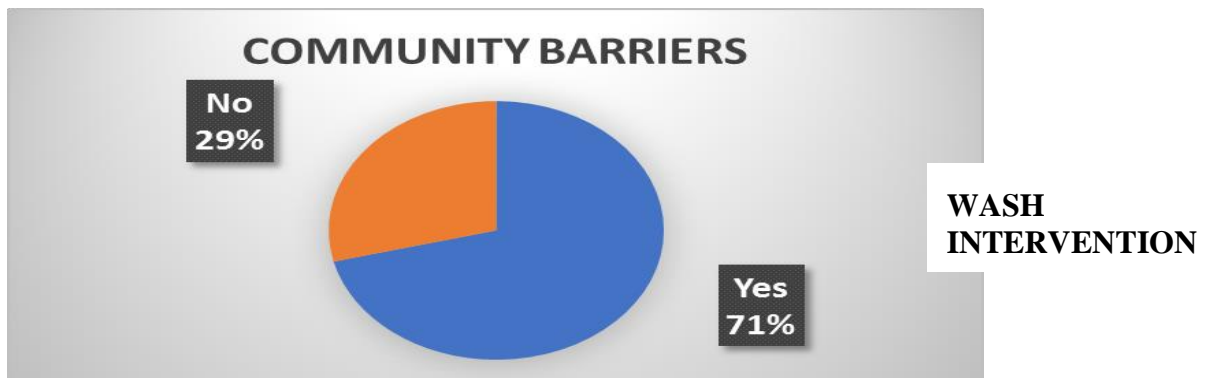
On WASH intervention, 71% (n=69) claimed the presence of barriers **"when it comes to seeking HIV treatment?"** with 29% (n=28) disagreed on the presence of community barriers. While for **non-intervention** group, 75% (n=72) claimed the existence of barriers and 25% (n=24) showing otherwise.

4.2.5 Ever experienced stigma
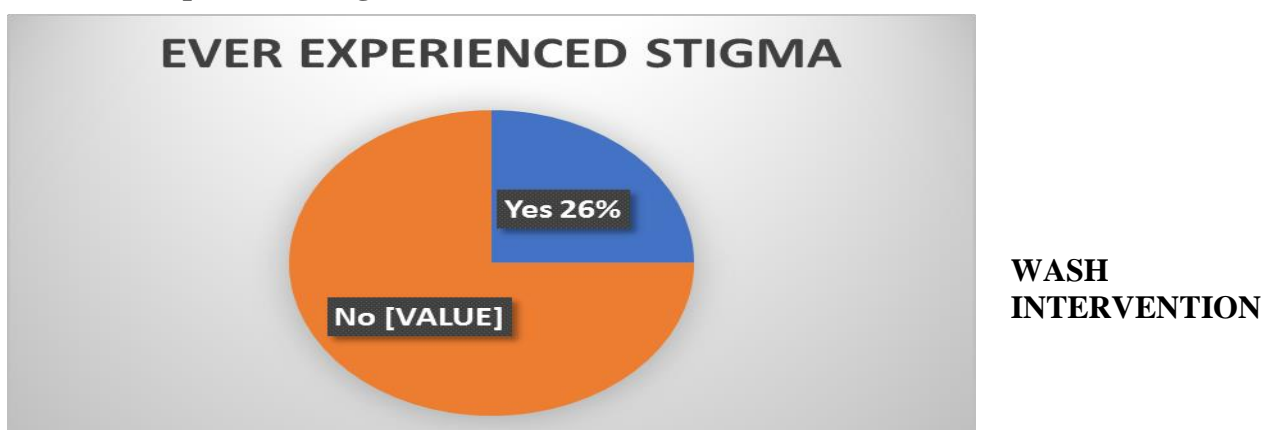
NON-INTERVENTION

On having experienced stigma, 74% (n=72) of the respondents from the **WASH intervention** showed having disagreed to have ever experienced stigma in relation to their HIV status with 26% (n=24) having had experienced stigma, while 71% (n=68) of the respondents from **non-intervention** group testified on having experience stigma in the past because of their HIV status with 29% (n=28) stated that they have never experienced stigma

4.2.6 Support group
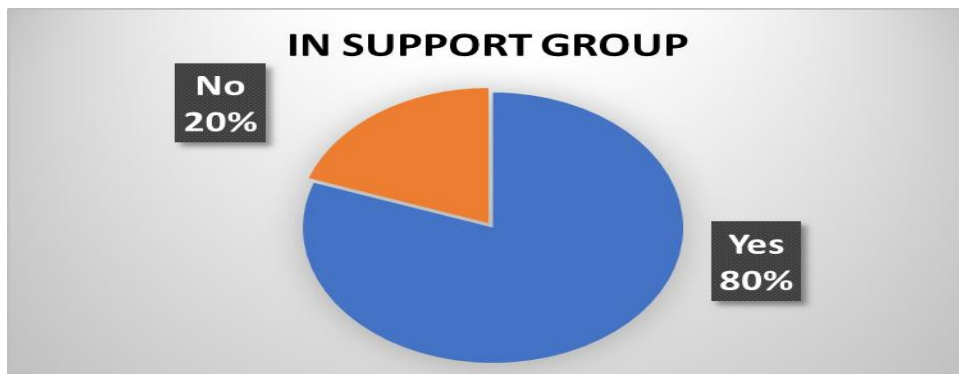
NON INTERVENTION
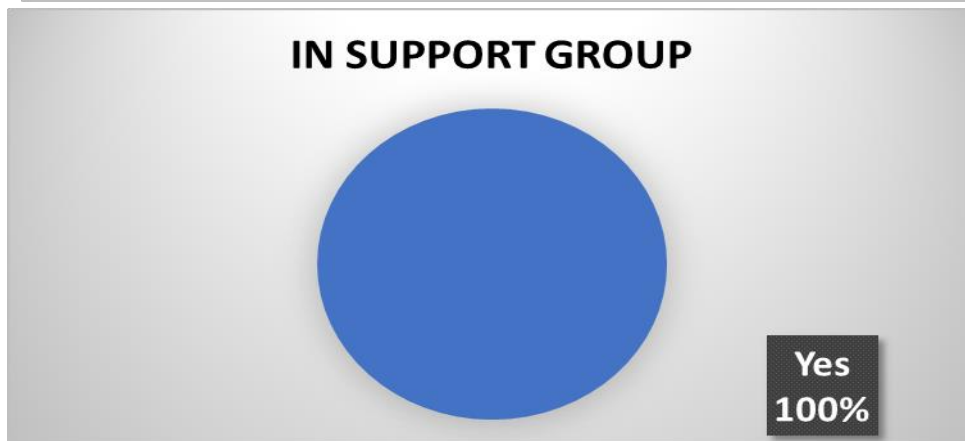
WASH INTERVENTION

4.2.7 Which support group

4.2.7.1 Why not on Support group?
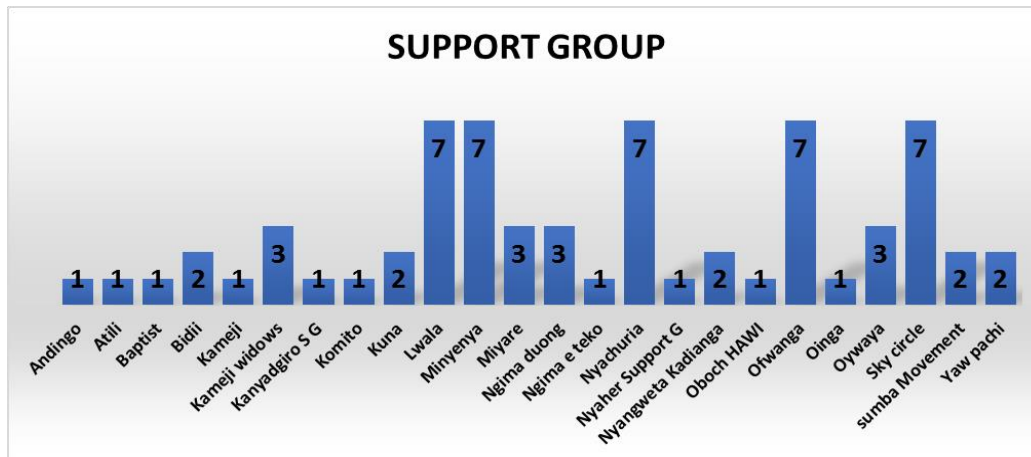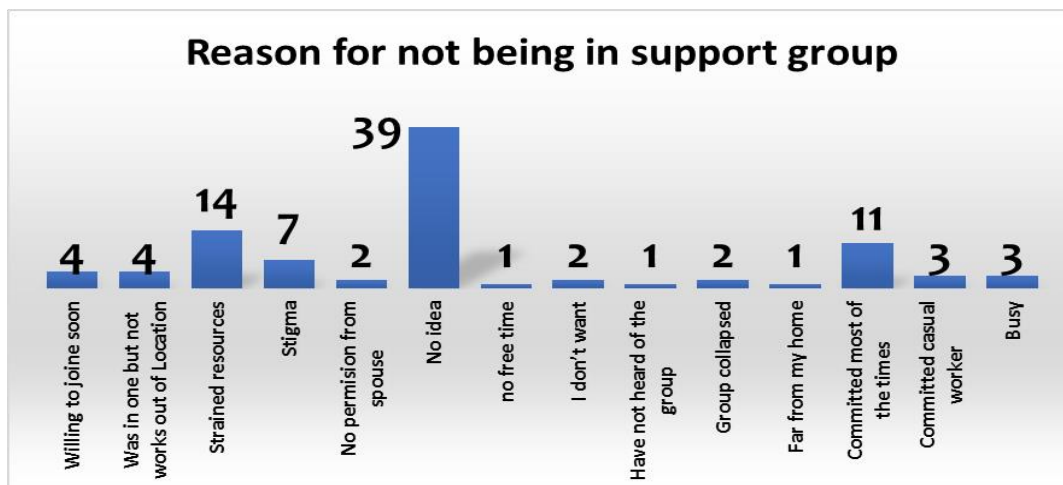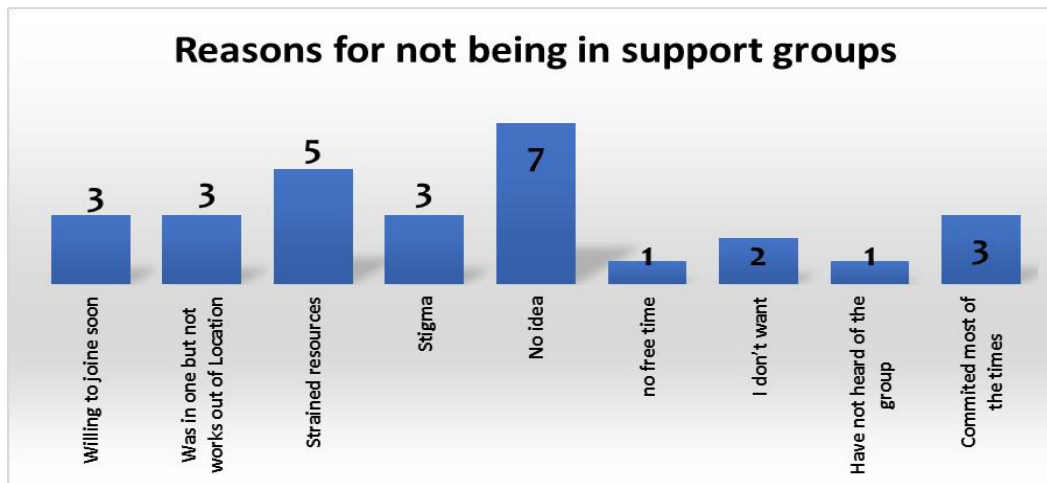
4.3 Relationship between Wash Intervention and Health Outcome

4.3.1 Wash compliance

For WASH compliance requirements, the respondents were asked whether they had Latrines, Tippy taps, compose pits, Drying rack, Access to safe drinking water, and whether they have a clothing line.
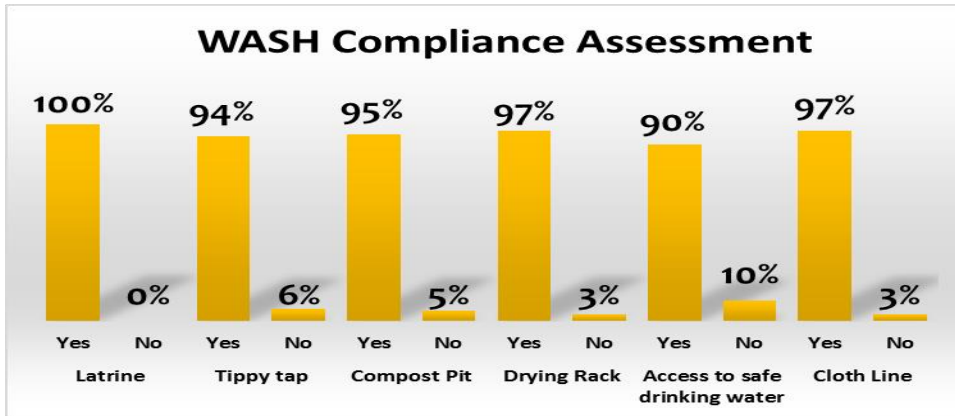
4.3.2 Source of drinking water
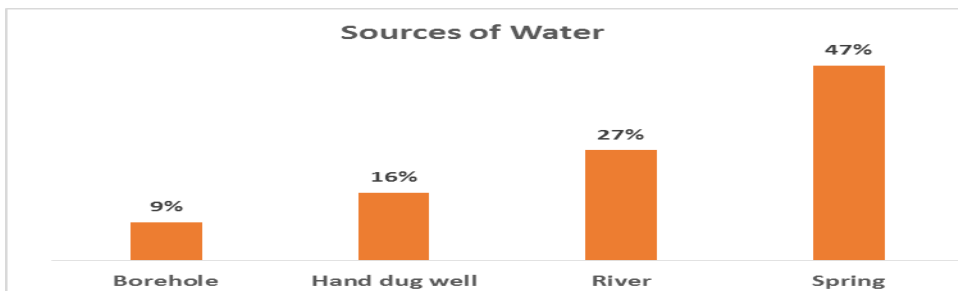
WASH INTERVENTION

From the visual display on **wash intervention** it can be seen that sources of water: 47% (n=46) was from spring, 27% (n=26) was from river, 16% (n=16) was from hand dug well while the remaining 9% (n=9) was from boreholes.
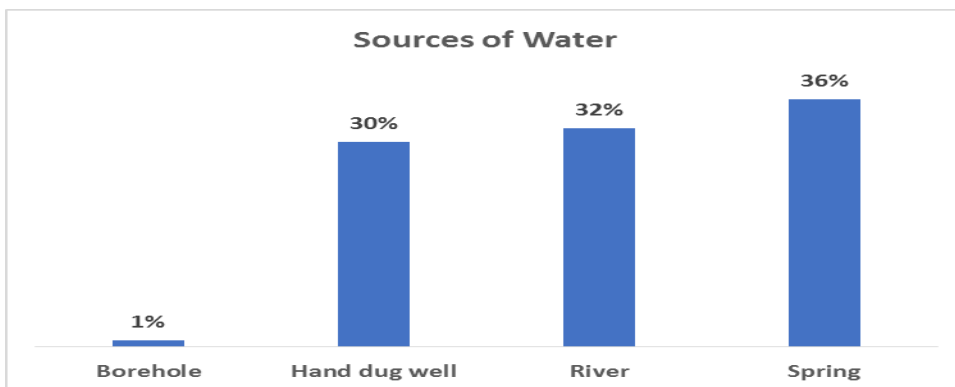
NON INTERVENTION

On non-intervention I established that 36% (n=35) got water from spring, 32% (n=31) was from the river,30% (n=29) got water from hand dug well while the remaining 1% (n=1) got it from borehole.

4.3.3 Access to safe drinking water
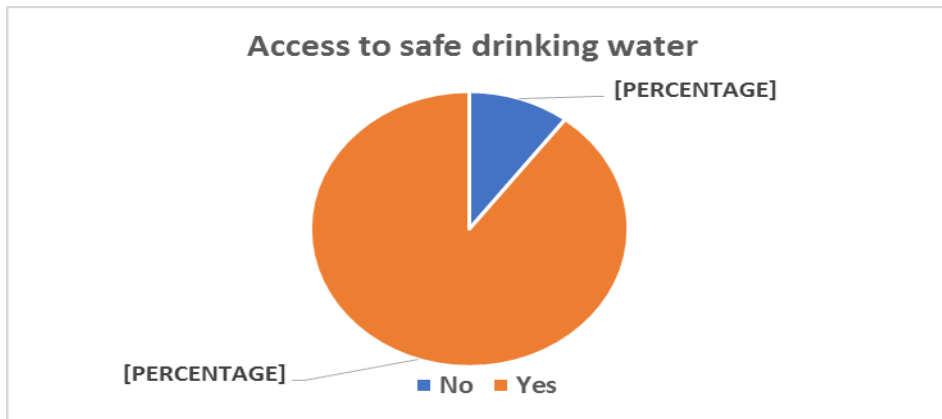
WASH INTERVENTION

- ➢ **On wash intervention,** access to safe drinking water 10% (n=10) said that they don't have access to safe drinking water while 90% (n=87) agreed that they have access to safe drinking water.
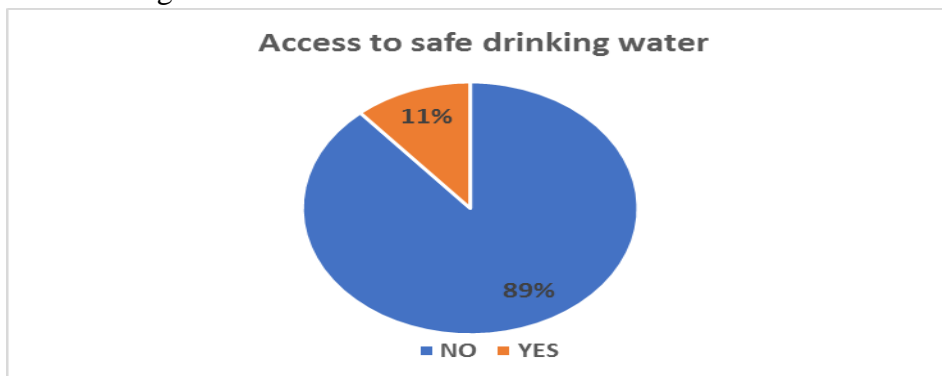
NON INTERVENTION

- ➢ **On Non-intervention,** access to safe drinking water 11% (n=11) said that they do have access to safe drinking water while 89% (n=86) disagreed that they don't have access to safe drinking water.

4.3.4 How to treat drinking water
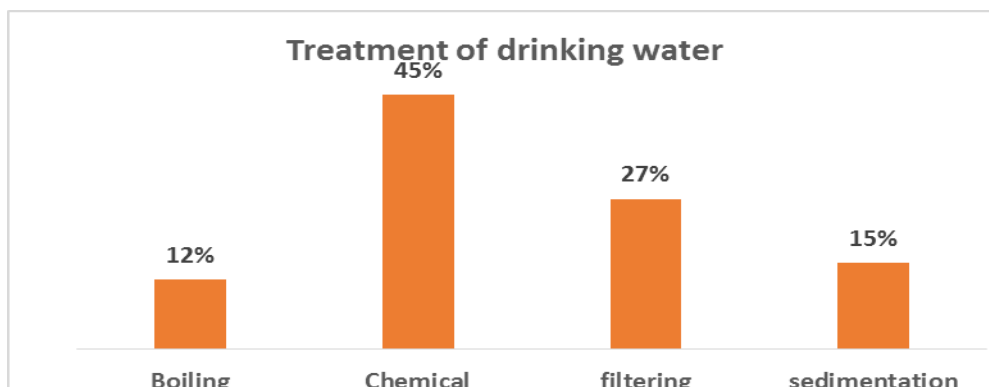
WASH INTERVENTION

On wash intervention treatment of water it can be seen that 45% (n=44) was from chemical, 27% (n=26) on filtering, 15% (n=15) on sedimentation while the remaining 12% (n=12) was on boiling of water
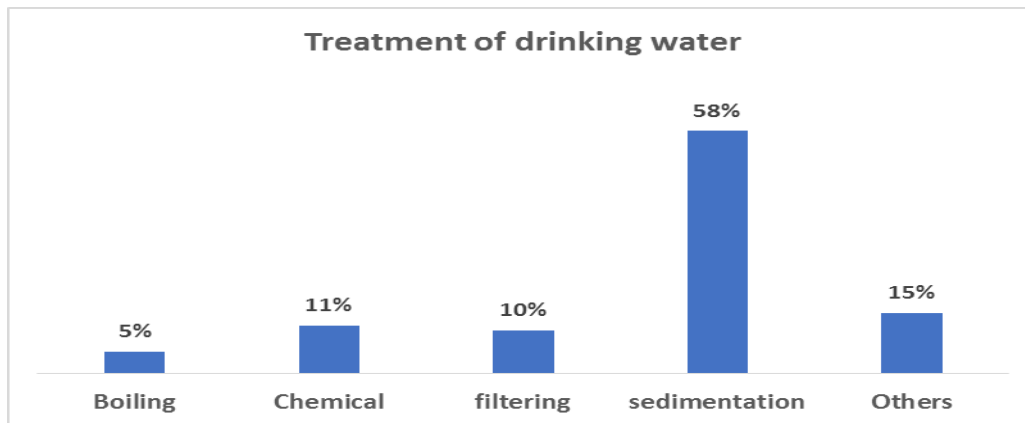
NON INTERVENTION

On non-intervention I established that 58%(n=56) treated water through sedimentation,11%(n=11) through the use of chemical,10%(n=10) by the use of filtering,5%(n=5) boiled their water while the rest 15%(n=14) used other means.

4.3.5 Medical condition
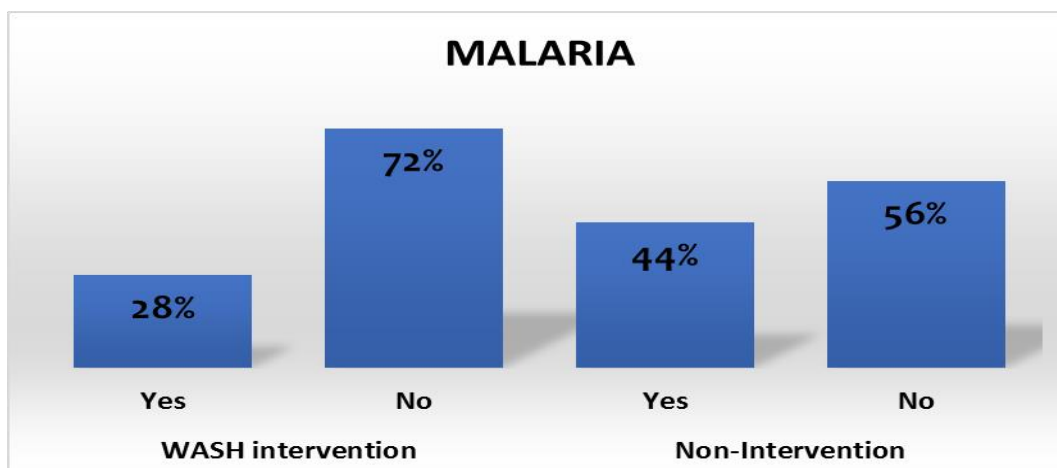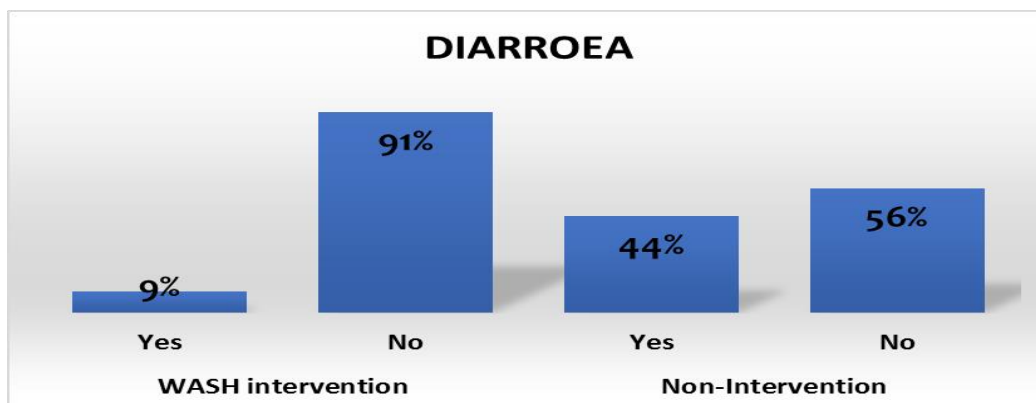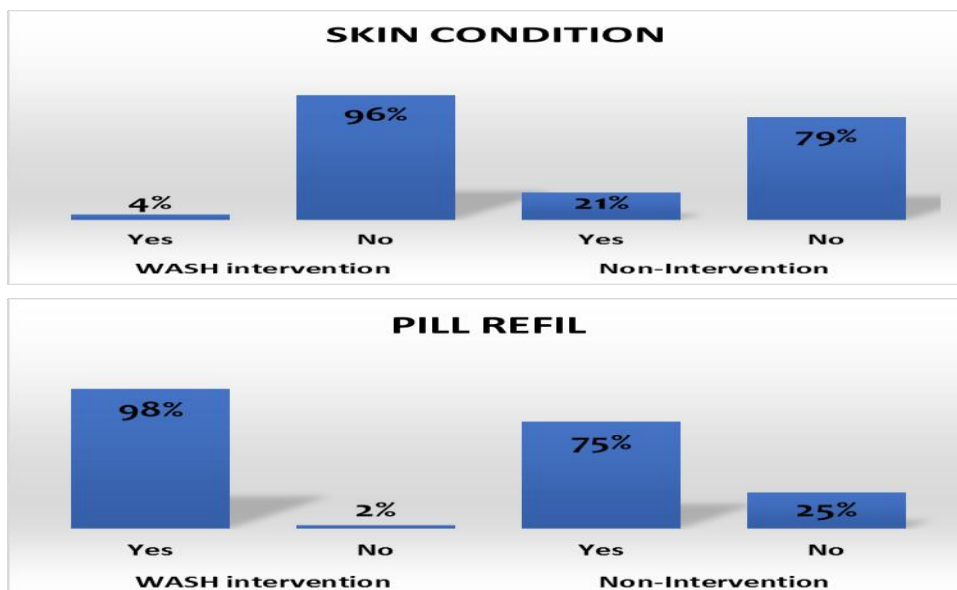
4.4 Inferential Statistics

4.4.1 The relationship between WASH intervention and Health outcome of PLHIV

On the tests of independence between WASH interventions and health outcomes among People Living with HIV, there indicated evidence of no independence between the two factors (χ (1)=0.334, p=0.193), since the p-value greater than 0.05 at 5% level of significance.

Test for independence between WASH intervention on health outcome among PLHIV

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.934[a]	1	.334		
Continuity Correction[b]	.756	1	.385		
Likelihood Ratio	.958	1	.328		
Fisher's Exact Test				.382	.193
N of Valid Cases	2910				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 38.97.
b. Computed only for a 2x2 table

On the tests of independence between WASH interventions and health outcomes among PLHIV, there indicated evidence of no independence between the two factors (χ (1)=0.334, p=0.193), since the p-value greater than 0.05 at 5% level of significance.

4.4.2 Differences between WASH intervention and health outcome among PLHIV

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
WASH_INTERV	Equal variances assumed	3.769	.052	-.966	2908	.334	-.008	.009	-.025	.009
	Equal variances not assumed			-1.003	1688.382	.316	-.008	.008	-.025	.008

From the independent sample t-test, there shows evidence of no significant differences between WASH intervention and health outcome among PLHIV with the p-value greater than 0.05 at 5% level of significance (t(2908)=-0.996, p=0.334).

4.4.3 Logic Regression model of the Health Care Outcomes in HIV Care and Treatment

Table 1: Dependent Variable Encoding

Original Value	Internal Value
No	0
Yes	1

On the encoding of the dependent variable, the health are outcomes coded as 0 for no effective outcomes on the WASH interventions with 1 implying a positive outcome. This made it possible for the development of the binary logistic regression with the response variable made of binary outcome.

Block 0: Beginning Block

Classification Table

			Predicted		
			Wash outcomes in HIV/AIDS patients		Percentage
	Observed		No	Yes	Correct
Step 0	Wash outcomes in	No	0	19	.0
	HIV/AIDS patients	Yes	0	77	100.0
	Overall Percentage				80.2

a. Constant is included in the model.

b. The cut value is .500

On the response variable, 19 persons implied the WASH outcomes on the HIV patients ineffective with 77 indicating effectiveness of the WASH outcomes. This showing that the interventions had some effects on the patients within the medical facilities in Rongo Sub-county.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	1.399	.256	29.843	1	.000	4.053

On the adequacy of the developed model, the WASH outcomes on the HIV patients proved statistical relevant in looking into the respective causative factors. This defined by the p-value less than 0.05 at 5% level of significance (Wald (1)=29.843, p=0.000) indicating the adequacy of the model developed.

On the variables included in the model, different independent variables such as demographic information, WASH interventions and Community-based health promotion and preventive interventions. On the demographic information, gender, marital status, age and occupation showed a positive effect on the WASH outcomes on the HIV patients (β=0.485, df=1, p=0.486), (β=0.1.643, df=1, p=0.200), (β=0.924, df=1, p=0.336), and (β=0.218, df=1, p=0.216), respectively.

On the WASH interventions, safe disposal of faeces, access to drinking water and adherence to ART having a positive effect on the WASH outcomes on the HIV patients with (β=5.372, df=1, p=0.020), (β=0.764, df=1, p=0.002), (β=0.037, df=1, p=0.848) and (β=1.579, df=1, p=0.209). The WASH interventions indicated safe disposal of faeces and access to safe

drinking water having a statistical significant effect on the WASH outcomes on the HIV patients.

4.4.4 Test for model coefficients

		Omnibus Tests of Model Coefficients		
		Chi-square	df	Sig.
Step 1	Step	28.336	14	.013
	Block	28.336	14	.013
	Model	28.336	14	.013

On the omnibus tests, the step, block and the model coefficients proved statistically adequate at 5% level of significant ($\chi^2(14)=28.336$, p=0.013). This implies the model appropriate for the underlying relationship to be investigated over time.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	67.184[a]	.256	.406

a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

On the model summary, there exists a weak explanation on the response variable (WASH outcomes on the HIV patients) from demographic information, WASH interventions and Community-based health promotion and preventive interventions. This with the Cox & Snell R-square=0.256, and Nagelkerke R-square=0.406. This shows the model having a low predictive power over the WASH outcomes on the HIV patients from the WASH interventions.

Parametric tests

		B	S.E.	Wald	df	Sig.
Step 1[a]	Gender	-1.440	.837	2.956	1	.086
	Marital status	.779	.391	3.968	1	.046
	Age	.020	.031	.395	1	.530
	Occupation	.196	.256	.588	1	.443
	Safe disposal of faeces	19.924	40193.035	.000	1	.000
	Menstrual waste management	21.420	14844.331	.000	1	.009
	Adherence to ART	19.295	22403.430	.000	1	.019
	Access to safe drinking water	-.625	.999	.391	1	.002
	Referral to health	1.350	.692	3.801	1	.051
	Financial initiatives	-.002	.004	.206	1	.050
	Vector control	.019	.677	.001	1	.978
	Education and training	20.306	11829.466	.000	1	.999
	Community mobilization	-1.128	.660	2.916	1	.018
	Constant	-77.258	49776.381	.000	1	.999

5.0 SUMMARY CONCLUSIONS AND RECOMMENDATIONS

Summary

On the variables included in the model, different independent variables such as demographic information, WASH interventions and Community-based health promotion and preventive

interventions. On the demographic information, marital status, age and occupation showed a positive effect on the WASH outcomes on the HIV patients except the gender of the patients (β=-1.440, df=1, p=0.086), (β=0.779, df=1, p=0.046), (β=0.020, df=1, p=0.530), and (β=0.196, df=1, p=0.443), respectively.

On the WASH interventions, safe disposal of faeces, menstrual waste management and adherence to ART having a positive effect on the WASH outcomes on the HIV patients except access to drinking water with (β=19.924, df=1, p=0.000), (β=21.420, df=1, p=0.009), (β=19.295, df=1, p=0.019) and (β=-0.625, df=1, p=0.002). The WASH interventions indicated all the WASH initiatives having a statistical significant effect on the WASH outcomes on the HIV patients.

On the Community-based health promotion and preventive interventions, Financial interventions and community mobilization indicated a negative effect on the WASH outcomes on the HIV patients (β=-0.002, df=1,p=0.050) and (β=-1.128, df=1,p=0.018) respectively. Referral to a health facility, vector control and education and training having a positive effect on the WASH outcomes on the HIV patients (β=1.350, df=1,p=0.051), (β=-0.019, df=1,p=0.978) and (β=20.306, df=1,p=0.999) respectively. This indicated that the financial interventions and community mobilization statistically significant in the model.

Conclusions

It was possible to conclude that On the WASH interventions, safe disposal of faeces, menstrual waste management and adherence to ART having a positive effect on the WASH outcomes on the HIV patients except access to drinking water. The study led to further conclusions that the WASH interventions indicated all the WASH initiatives having a statistical significant effect on the WASH outcomes on the HIV patients. The study also concluded that on the Community-based health promotion and preventive interventions, financial interventions and community mobilization indicated a negative effect on the WASH outcomes on the HIV patients and that Referral to a health facility, vector control and education and training were having a positive effect on the WASH outcomes on the HIV patients.

Recommendation

The study recommends that HIV-positive women and their caregivers must prevent HIV transmission from menstrual blood by practicing universal precautions.

References

Brown L, Macintyre K, Trujillo L.(2003). Interventions to reduce HIV/AIDS stigma: what have we learned? AIDS Education and Prevention. 2003; 15:49–69

Bushen, O., et al. (2004). Diarrhea and Reduced Levels of Antiretroviral Drugs: Improvement with Glutamine or Alanyl-Glutamine in a Randomized Controlled Trial in Northeast Brazil. *Clinical Infectious Diseases*. 38(12), 1764-70.

Curtis, V. and Cairncross, S. (2003). Effect of washing hands with soap on diarrhea risk in the community: *A systematic review*. The Lancet 3: 275-281

Gundry, S., Wright, J. and Conroy, (R. 2004.) A systematic review of the health outcomes related to household water quality in developing countries. *Journal of Water and Health* 2(1): 1-13.

Hutton, G., & Bartram, J. (2008). Regional and global costs of attaining the water supply and sanitation target (Target 10) of the Millennium Development Goals. World Health Organization, Geneva.

Kamminga, E. and Wegelin-Schuringa, M. (2006). HIV/AIDS and Water, Sanitation and Hygiene: Thematic Overview Paper. Delft: IRC International Water and Sanitation Centre. http://www.irc.nl/content/download/4199/ 48511/fi le/TOP2HIV_AIDS05.pd

Lule, J., et. al. (2005). Effect of home-based water chlorination and safe storage on diarrhea among persons with human immunodeficiency virus in Uganda. *American Journal of Tropical Medicine and Hygiene.* 73(5), 926-33.

Malcolm, A. et al. 1998. "HIV and AIDS-related stigmatization and discrimination: its form and contexts," *Critical Public Health* 8(4):347-370.

Ngwenya BN, Kgathi DL(2006). HIV/AIDS and access to water: A case study of home-based care in Ngamiland, Botswana. *Journal of Physics and Chemistry of the Earth.* 2006, 31: 669-680. 10.1016/j.pce.2006.08.041

Prendergast, A. & Kelly, P. (2012). Enteropathies in the Developing World: Neglected Effects on Global Health. *American Journal of Tropical Medicine and Hygiene.* 86(5), 756-763.

Stark, D., et. al. (2009). Clinical Significance of Enteric Protozoa in the Immunosuppressed Human Population. *Clinical Microbiology Review.* 22 (4) 634-650.

UNAIDS, "Global Report 2013: UNAIDS Report on the Global AIDS Epidemic 2013," February 2015,

World Health Organization. (2014). *Number of people (all ages) living with HIV.* http://www.who.int/gho/hiv/epidemic_status/cases_all_text/en/