Caretakers' hygiene practices towards occurrence of diarrhea to under-five years in semi-pastoralist society in Siha District, Tanzania

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October, 2019

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCE
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CARETAKERS' HYGIENE PRACTICES TOWARDS OCCURRENCE OF DIARRHEA TO UNDER-FIVE YEARS IN SEMI-PASTORALIST SOCIETY IN SIHA DISTRICT, TANZANIA

BY

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A dissertation Submitted in partial Fulfillment of the Requirements for the Degree of Master of Public Health of Muhimbili University of Health and Allied Sciences
October, 2019

CERTIFICATION

The undersigned certifies that, she has read and hereby recommends for examination by the Muhimbili University of Health and Allied Sciences a dissertation entitled ***"Caretakers' hygiene practices towards occurrence of diarrhea among children under-five years in semi-pastoralist society in Siha District",*** in (partial) fulfillment of the requirements for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

_____

Gloria Sakwari, PhD

(Supervisor)

Date_____

DECLARATION AND COPYRIGHT

I, **Dafrosa Peter Lyimo**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other university for similar or any other degree award.

Signature: _____ Date: _____

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ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my supervisors Dr. Gloria Sakwari, who have provided guidance, directions and support in the development of this dissertation. Your kind and tireless guidance is remarkable and may I acknowledge that I have learnt a lot from you and thank you very much.

Secondly thanks should go to my Research Assistants for the high spirit they have shown during data collection; namely Gladness Masaki, Neema Massawe, Yohana Mathayo and Shedrak Molell.

My employer Mkuranga District Executive Director for your permission for studying this course, it is my hope that the knowledge obtained will be useful in improving my performance at work.

Lastly but not least I would like to thank my colleagues for their comfort and company.

DEDICATION

This work is dedicated to my dearest husband **Mr. Pascal Augustine** as well as my beloved daughters **Christine and Gladness** for your patience, care and comfortable environment for preparation of this work. Your contribution to my career is remarkable and appreciable. May God bless my family and my footstep while climbing academic ladder.

Thank you once again,
Dafrosa.

ABSTRACT

Introduction: The occurrence of diarrhea among children under-five years of age is associated with poor hand hygiene, unsafe drinking water, un-proper fecal disposal practices and poor child feeding practices among caretakers.

Objective: The aim of the study was to assess caretakers' hygiene practices associated with the occurrence of diarrhea among children of under-five years in semi-pastoralist society in Siha District.

Methods: This was a cross-sectional study design which done using quantitative approach. Multistage cluster sampling was used to sample research wards, villages and household. Questionnaire with structured questions was used to collect data. Data was analyzed using IBM SPSS version 22. Descriptive statistics and Multiple logistic regression analyses were performed to determine factors that are strongly associated with dependent variable and $p<0.05$ was considered to have a significance association.

Results: About 24.6% of the children below five years of age under the study have been reported to have suffered from diarrhea. Caretakers poor hand washing after using toilet and after washing the defecated child, Family members behavior of drinking the untreated water, the use of any utensils or the same cup for drawing and drinking water, caretakers poor hand hygiene before child's food preparations and feeding and the improper child feces disposal were associated with the occurrence of diarrhea among children.

Conclusion: The study reveals that, caretakers poor hand hygiene at the critical time, improper handling of drinking water, unhygienic food preparation and feeding together

with poor management of human feces were associated with the occurrences of diarrhea among children

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ABBREVIATIONS

ABHRs	Alcohol-based hand rubs
AMR	Anti-microbial Resistance
CBOs	Community Based Organizations
FAO	Food and Agriculture Organization
HAI	Health Care Associated Infections
IPC	Infection Prevention Control
MCH	Maternal and Child Health
MOHCDGEC	Ministry of Health Community Development Gender Elderly and Children
MUHAS	Muhimbili university of Health and Allied sciences
NGOs	Non-Governmental Organization
SPSS	Statistical Package of Social Sciences
TDHS	Tanzania Demographic Health survey
UNICEF	United Nations Children's Fund
WB	World Bank
WHO	World Health Organisation

OPERATIONAL DEFINITIONS OF TERMS

1. Diarrhea.

According to WHO, Diarrhea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual) (WHO, 2017).

2. Hygiene

According to the World Health Organization (WHO), "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases.

3. Hygiene practice

This refers to the application of hygiene behavior at different matters. It includes personal, environment and food preparations hygiene.

4. Water source

Water source is defined as improved-water sources if the sources were either of the following: household connections, public standpipes, protected dug wells, rain and protected springs. Unimproved-water sources included unprotected dug wells, unprotected springs and rivers.

5. Safe drinking water

Safe drinking water is water that is safe to drink or to use for food preparation, without risk of health problems. It has been either treated, cleaned or filtered and meets the local established drinking water standards. Or, it is assumed to be reasonably free of harmful bacteria and contaminants and also considered safe to use in cooking and baking.

6. Proper excreta disposal

Proper excreta disposal is the safe disposal of human feces so that it does not contaminate the environment, water, food, or hands in order to ensure a healthy environmental and for protecting personal health.

7. Hand washing practice

Hand washing defined as if a mother/ caregivers had a practice of hand washing after toilet, before child fed, and before having contact with food or any contaminated utensils

using clean water and soap or ash which was considered as “All practice” if not “partially”

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Hand hygiene is now regarded as one of the most important elements of infection control activities. It is the cornerstone of infection prevention and control (IPC). Hand washing and basic hygiene behavior, as observed in several studies, could minimize the spread of germs and as such prevent diarrhea (Stedman-Smith et al, 2015). Intervention studies have consistently demonstrated that communities which received intensive hand washing promotion especially among the care-givers have less childhood diarrhea (Cevizci et al, 2015). According to UNICEF, rates of hand washing around the world are low (UNICEF, 2015).

Water is one of the basic needs for survival but contaminated drinking water is a major health hazard in developing countries, and water related diseases are a significant contributor to the global burden of illness (Mattioli et al, 2013). Contaminated water can transmit diseases, diarrhea among others (WHO, 2018). Globally, 2 billion people use a drinking water source contaminated with feces (WHO/UNICEF, 2017). For the populations without reliable access to safe drinking water, water treatment provides a means of improving water quality and preventing diarrhea (Ibrahim et al, 2016).

Feces are the main Source of diarrhea diseases among under five years' children. Open feces in the compound can increase risk of fecal exposure for compound members' especially young children who spend time in the courtyard area and have hand contact with the feces or with the soil that has been contaminated by feces (Kwang et al, 2016). Poor excreta disposal is due to low coverage of latrine in the households. Some of the barriers to the use of latrine especially the VIP type are inability of the household to construct latrines and the high cost involved (Kamara et al, 2017).

Complimentary foods after six months are needed because the child needs of energy and nutrients starts to exceed what is provided by the breast milk (WHO,2018). Poor child feeding and poor hygiene for instance unhygienic preparation of food, poor food storage, habit of eating raw foods and cold foods can lead to diarrhea among the under five years children (Gizaw et al, 2017).

1.2 Problem Statement

Diarrhea diseases are major public health disease in low-income countries. Globally diarrhea remains the second most common cause of death among under five years of age, with about 1.7 billion cases and 11% deaths per year (Ferdous et al, 2013). Causes of diarrhea to under five includes, unhygienic behavior of caretakers, poor sanitation and infections caused by a host of bacterial, viral and parasitic organisms spread by feces-contaminated water. Most diarrhea cases to children of under-five years can be prevented using safe drinking water, personal hygiene and sanitation measures (Kumar and Subita et al. 2012).

Studies reveal that the increase risk of diarrhea to under five years children is associated with drinking water within unacceptable standards (Kakulu, 2012), behavior of mother/caretakers regarding washing hands before preparing food, after changing child's napkins, and after visiting toilet and improper food preparation practices (Park, et al, 2010), (Silas Kabhele et al, 2018). However, although the determinants of diarrhea among children under five years of age are well described in the previous researches still there is limited information on hygiene behavior practices among caretakers of children under five years in semi-pastoralist societies, therefore this study aims to fill the gap. The results of this study will be useful in designing an intervention study, health plans and policies related to mother/caretakers and child hygienic behavior

1.3 Conceptual Framework

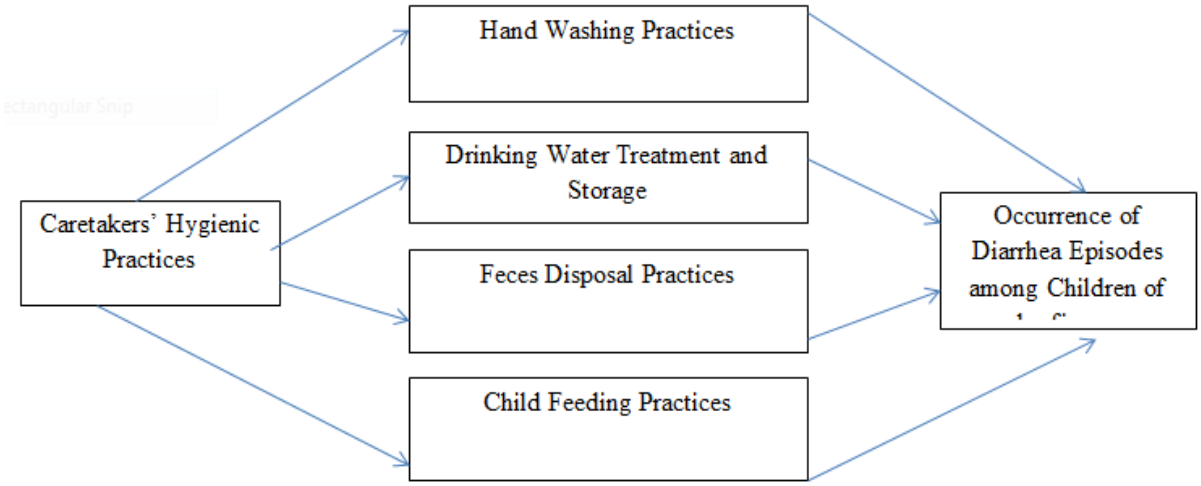

Figure 1 1: Conceptual Framework

Conceptual framework on caretaker factors which may cause occurrence of diarrhea among children under-five years.

Source: researcher's own source

In this conceptual frame work: The outcome variable "occurrence of diarrhea among under five years" it is explained by the independent variable. Poor hand washing behavior predisposes one to diseases/diarrhea transmission. In adequate water supply, untreated drinking water and poor drinking water storage will facilitate the eruption of diarrhea. The behavior of defecating in bushes/open defecation/dirty toilet, improper household child's feces disposal, also can facilitate the occurrence of diarrhea**.** Low level of education among caretakers entails poor knowledge of hygiene issues. Low Household Wealth entails poverty.

1.4 Rationale of the Study

The significance of this study is to understand the relationship between hygiene practices among caretakers and the occurrence of diarrhea among under-five year's

children in semi-pastoralist societies. The study will generate information on the hygiene practices which can help to reduce diarrhea among under-five year's children. Therefore, the findings of this study will be used by the community, government, NGOs and CBOs to plan for more interventions which will increase knowledge, awareness and hygiene practices behavior to the children caretakers in order to reduce the diarrhea incidences among the children.

1.5 Research Questions

1.5 1 Main Research Question

What are the semi-pastoralists caretakers' hygienic practices which influence the occurrence of diarrhea among children of under five years?

1.5.2 Specific Questions

1. To what extent do caretakers of under-five year's children wash their hands**?**

2. To what extent do caretakers of under-five year's children treat the drinking water?

3. To what extent do child feces managed by caretakers of under-five years children?

4. What are the child feeding practices associated with episodes of diarrhea among children of less than five years of age?

5. What are the caretakers hygiene practices which influences the occurrences of diarrhea among children under five years of age in their care?

1.6 Main Research Objective

- To assess the caretakers' hygiene practices which influence the occurrence of diarrhea episodes among children of under-five years in semi-pastoralist society in Siha District.

1.7 Specific Objectives

1. To assess hand washing practices among caretakers of children under-five years.

2. To determine drinking water treatment practices among caretakers of children under-five years.

3. To assess excreta disposal practices among caretakers of children under-five years.

4. To determine the feeding practices associated with episodes of diarrhea among children of under-five years of age.

5. To determine caretakers hygiene practices which influence the occurrences of diarrhea among children under five years of age in their care.

CHAPTER TWO

2.0: LITERATURE REVIEW

2.1 Hand washing Practices among caretakers of Under-five years Children.

Poor hand washing behavior can cause under-five years of age diarrhea (Mattioli et al, 2013). Proper hand washing behavior could minimize the spread of germs and as such prevent diarrhea (Stedman-Smith et al, 2015). Hand washing with soap is more effective than washing hands with water only (Panda and Vashisht, 2015).

It was estimated that 19% of people worldwide wash their hands with soap after contact with excreta. The percentage of people who wash their hands with water and soap is high in high-income countries than in low-income countries (Freeman et al, 2014). In Kenya, soap was observed in 97% of the household; 96% of them use the multipurpose soap. Hand washing stations were observed in wealthier households than in poor households (Kamm et al, 2014). In Tanzania hand washing with soap after using the toilet was reported to be 62% in low income urban areas (Pauschert et al, 2012). In semi-pastoralist societies hand washing at critical moments ranges from 2% to 9% (Mshinda et al, 2017). However, it is known that frequently hand washing is very important to prevent diarrhea to under five years children (Agustina et al, 2013), what is not known is the reason for the failure to implement proper hand washing among caretakers of under five years children.

2.2 Safe Drinking Water Practices among Caretakers of Under five years Children.

Water related diseases are a significant contributor to the global burden of illness (Mattioli et al, 2013). Globally, 2 billion people use drinking water sources contaminated with feces (WHO/UNICEF, 2017). It is estimated that, the contaminated drinking water cause 502,000 diarrheal deaths each year (WHO, 2018) and more than 125 million under five years children live in household without access to safe drinking water (Meena et al, 2012).

In rural Africa, less than half of the population has access to safe drinking water (WHO, 2016), those who do not have access to safe drinking water, different water treatment approaches are used. It was reported that nearly half of the population are treating water at their homes; more than half of them by boiling, 20.7% by stand and settle while 19.6% use chlorine chemicals (Belay et al, 2015). Household water treatments were high in urban areas 79% and less in rural areas 28% (Ghislaine et al, 2016). In rural Tanzania, it is estimated that 46% of Tanzania's rural population have no access to safe water sources (WHO/UNICEF, 2014) and due to that different methods of treating water are promoted but boiling is the common method used by many people, 47% in urban areas and 24% in rural areas (TDHS, 2015/2016). It is known that, household water treatments may reduce the risk of diarrheal disease morbidity (Wolf et al, 2014), but it is not known if people in semi-pastoralist societies can manage to treat water for drinking.

2.3 Fecal disposal Practices among Caretakers of under-five years Children.

Improper fecal disposal is a major risk for the outbreak of diseases (Bello et al, 2016). Globally, One billion people practice open defecation, even in settings where there is wide spread latrine coverage and adult open defecation is infrequent, young children continue to defecate directly in the living environment (WHO/UNICEF, 2014). Open feces in the ground can increase risk of fecal exposure especially young children who spend time in the compound areas and have hand contact with the feces or with soil that has been contaminated with feces (Kwang et al, 2016).

In Africa, 80% of people are reported to practice unsafe fecal disposal. Most of them dispose fecal in bushes 64%, open heaps 18%, drains 13%, left in the ground 11%

(Islam et al, 2018). Studies done in rural areas of India reported that 72 % to 80% of household practice unsafe children excreta disposal and those children are allowed to defecate on the compound or inside the house (Preeti et al., 2016; Islam et al., 2018). These habits have also been reported by 38% among survey households in Tanzania (WB, 2014). In Tanzania open defecation was reported as <1% in urban areas surveyed (Pauschert et al, 2012) and environmental waters are also frequently used as a site for open defecation in other cities, as observed in the coastal city of Tanga were members of the informal settlements use the adjacent Indian Ocean (Mhina, 2013). However, it is known that improper fecal disposal is a major risk for the outbreak of diseases (Bello et al, 2016) but it is not known that poor latrine condition can increase the risk of diarrhea diseases.

2.4 Child feeding Practices associated with diarrhea to Children less than five years.

Child feeding practices associated with diarrhea episodes to children of under-five years of age are complementary feeding. Complimentary foods after six months are needed because the child needs of energy and nutrients starts to exceed the amount provided by the breast milk (WHO, 2018).

Globally, under-nutrition is associated with 45% of child deaths. In 2015, about 155 million children of under-five years were estimated to be stunted (too short for age), 52 million were estimated to be wasted (too thin for height) and 41 million were overweight. It was reported that about 25.8% of children who are given complimentary foods had diarrhea. Reasons for diarrhea being given cold foods, caretakers not washing their hands before they start feeding them (Acharya et al, 2017). In Africa, there is a poor child feeding practices which facilitate the occurrence of diarrhea episodes to children under-five years. It was reported that 50.6% of children less than two years who started complimentary feeding were given uncooked foods like raw milk, 73.8% have been given foods immediately after cooking and 56.7% of the mothers have been washing their hands with water only before preparing child meal and feeding their children (Gizaw et al, 2017).

In Tanzania, it was reported that infants who received solid, semi-solid and soft foods at age 6-8 months were 3 times more likely to experience diarrhea and also to children aged 0-23 months who were bottle-fed were more likely to experience diarrhea (Ogbo et al, 2018). Food Storage and reheating practices can also be one of the mega source of contamination such habits have less been reported from Tanzania societies however they are practices in agricultural and animal raring families. It is known that, Complimentary foods after six months are needed because the child needs of energy and nutrients starts to exceed what is provided by the breast milk (WHO, 2018) but what is not known is how caretakers' poor hygienic practices during child feeding contribute to the occurrence of diarrhea to under-five years children.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Study Setting and Study Design

The cross-sectional study design using quantitative methods was conducted in Siha District. Siha district council is one of the seven districts that form Kilimanjaro region. It is about 40 kilometers from Kilimanjaro region headquarters. This District was established in 2005 after division of Hai District. Siha District is bounded on the South by Hai District, Northern by Rombo and Longido Districts, Western by Hai and Meru Districts. Siha district has 12 wards and 39 villages which have total of 116,813 people.

Among them are 56,500 men and 59,813 women. Average number of people in the household is 4. Existing tribes are Chaga, Maasai, Meru, Pare, Safwa and other tribes.

3.2 Study Population, Sample Size and Selection of Participants

3.2.1 Study Population

The study populations were children under the age of five years and their caretakers. The caretakers were interviewed about their hygienic practices and about issues concerned to under-five year's children diarrhea episodes. The caretakers in this study included child's father, mother or any relative with the sufficient information on the child and household characteristics.

3.2.2 Sample Size

The sample size of this study was 248 respondents including 10% of non- respondents, calculated through the following formula

Sample Size for Frequency in a Population

Population size (for finite population correction factor or FPC) (N):	20,000
Hypothesized % frequency of outcome factor in the population (p):	11%+/-5
Confidence limits as % of 100(absolute +/- %) (d):	5%
Design effect (for cluster surveys-DEFF):	1.5

Sample Size (n) for Various Confidence Levels

Confidence Level (%)	Sample Size
95%	224
10% of Non-Response Rate	24
Total sample size	248

Sample Size n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]

Source: http://www.openepi.com/SampleSize/SSPropor.htm

Therefore, a total of 248 respondents were recruited in this study.

3.2.3 Sampling Procedures and Techniques Applied.

Multistage cluster sampling was used for selection of participants. At first, four wards were sampled at random from the 8 wards occupied with semi- pastoralists in the district. Next, two villages were sampled at random in every study ward to give eight study villages. At last, 31 households were sampled in every village through spinning the bottle technique at the beginning to select starting direction. A systematic sampling strategy was used to select the households for the study by skipping two households after each sampled house. In case a household was found to have more than one child of under-five years of age, a simple random sample using paper numbers was applied to select the child for the study. In case a sampled household has no child under the study target age group, the nearest house was selected to replace the household.

3.2.4 Inclusion and Exclusion Criteria

The study sample involved children of less than five years and their caretakers in Magadini, Mawasiliano, Ashengai, Kandashi, Orkolili, Mkombozi, Ormelili and Sayuni villages of the Siha District. If the selected household had more than one under-five years children, only one child was selected randomly to be involved in the study. Children or Caretakers who were found to be seriously sick and children or caretakers who were found to be visitors/ not belong to that household were excluded from the study.

3.3 Data Collection Methods and Tools

Primary data collection methods involved household's surveys and field observations. Household data was collected through interviewing the caretakers of under five years of age who were 18 years or above using structured questionnaire adopted from UNICEF survey on Monitoring WASH practices at household level in Gaza in 2009 which was modified to fit the households in semi-pastoralist society.

The questionnaire addressed the following particulars; the first section was to assess the demographic characteristics that influenced hygiene behavior such as age, sex, levels of

education, marital status, occupation and socio-economic status. The second section assessed the Personal Hygiene Practices; critical moments of hand washing behavior; washing hands before preparing food or eating, after changing the child's diapers, after doing cleanness, and after using toilet and Food Preparation Practices. The third section was to assess the safe drinking water practices; drinking water sources, drinking water treatments methods, drinking water storage and the withdrawal of water for drinking from the storage container. The fourth section assessed the waste disposal practices; type of toilet, toilet conditions, distance from house to the toilet, child feces disposal place, solid waste disposal, and liquid waste disposal and the last section was to determine caretakers practices associated with childhood diarrhea episodes; breastfeeding practices, and complimentary feeding. In addition to that, participants were asked about the episode of the under-five year's children diarrhea episodes with the recall period of past three (3) months in the selected households. If in the household was observed to have the disease, then specific questions about diarrhea characteristics were asked on the severity of diarrhea and the use of health care practices to treat diarrhea including administration of Oral rehydration solution and whether doctor was consulted. English version interview questions were translated into Swahili to obtain data from the study participants and to ensure that they understand the contents properly. Visual inspections of environmental cleanliness were also performed in the field site.

3.4. Recruitment and Training of Research Assistants

Two research assistants was recruited, at least form six leavers and who are the residence of Siha District. The assistants had a two days orientation to research concept, protocol, collection of data and the filling of the questionnaire.

3.5 Study Tools' Validity and Reliability Issues

In order to assure the validity and reliability of the study, The Principle Investigator (PI) along with Research Assistants (RAs) tested the questionnaire in the 15 households of the Wiri village in Siha District in order to measure whether participants understood the questions. The research assistants were also used this opportunity to gain more interview skills. Moreover, the questionnaires were tested to check whether they generate the

intended results. Errors were noted in the pre-test exercise including the interview protocols which were then corrected before actual data collection.

3.6 Data Processing and Analysis

The collected data were checked and coded. Then data entry was done by using excel and then exported to IBM SPSS computer software version 22 for analysis. Univariate and multivariate analyses were performed to determine factors that strongly affect the dependent variable and $p<0.05$ was used to interpret the significance of the statistical test. Descriptive statistics presented in tables was used to assess personal hygiene practices and to depict the occurrence of diarrhea among children less than five years for the period of three months prior to the study.

Furthermore, cross tabulation was employed to determine the drinking water treatment practices among caretakers of under-five year's children and its relation to diarrhea episode among the under-fives. Cross tabulation using chi square statistical test was used to assess the household fecal disposal practices among caretakers of under-five year's children in relation to the occurrence of diarrhea episodes. Multiple logistic regressions were used to determine feeding practices associated with episodes of diarrhea among children less than five years.

3.7 Ethical Issues and Consideration

The Muhimbili University of Health and Allied Sciences (MUHAS) Ethical Committee provided ethical clearance. Permission to conduct the study was requested and provided by the Siha District Executive Director. The head of household and study respondents gave informed consent after being informed on the purpose of the study. Confidentiality of the respondents was ensured at all stages of the study. The respondents were asked of free participation and that they could withdraw at any time without being asked to give reasons. In areas where severe situations of unhygienic practices were observed health education was provided at the household level and it will also be provided during dissemination in collaboration with the healthcare personnel in the village.

CHAPTER FOUR

4.0 RESULTS

This study investigated the caretakers hygienic practices associated with the occurrence of diarrhea among children of under-five years in semi pastoralist societies in Siha District.

4.1 Social-Demographic Characteristics of the Respondents

Two hundred and forty eight caretakers of Children between the age of 6 to 59 months were interviewed to assess hygienic practices associated with the occurrence of diarrhea. Among the interviewed caretakers**,** 82.3% were female (mothers, grandmother and aunts) and 17.7% were males (father, grandfathers and uncles)More than three quarter were married, and nearly half of the households surveyed had 5-7 family members, 56.5% of the respondents have the primary education, 12.5% have post primary education and 31.0% had not attended any formal education (Table 1)

4.2 Socio-Demographic Characteristics of the Study Population (Children 6-59 months)

Of the children participated in this study, 51.6% were female and 48.4% were males, more number of the children who participated in the study were from the age group of 13-24 months who were 31.5% followed by 37-59 months who were 30.2%, 96.8% were in either breastfeeding or were breastfed until 2 years and they were all well-nourished (Table 2).

Table 1 **Socio demographic characteristics of the respondents (n=248)**

VARIABLE	CATEGORY	n(%)
Relationship to the child	Mother	192 (77.4)
	Father	42 (16.9)
	Grandmother/Father	10 (4.0)
	Others	4 (1.6)
Age of the respondent	<25	66 (26.6)
	25-29	51 (20.6)
	30-39	83 (33.5)
	>40	48 (19.4)
Sex of the respondent	Male	44 (17.7)
	Female	204 (82.3)
Marital status	Single	29 (11.7)
	Married	203 (81.9)
	Divorced	14 (5.6)
	Widow/widower	1 (0.4)
Educational level	No formal education	77 (31.0)
	Primary education	140 (56.5)
	Post p/s education	31 (12.5)
Family Size	2-4	9 (3.6)
	5-7	112 (45.2)
	8-10	76 (30.6)
	11+	51 (20.6)

Table 2 **Socio-demographic characteristics of the children under study (06-59months) (n=248)**

VARIABLE	CATEGORY	n (%)
Age(Months)	06-12	47 (19.0)
	13-24	78 (31.5)
	25-36	48 (19.4)
	37-59	75 (30.2)
Gender	Male	120 (48.4)
	Female	128 (51.6)
Weight (Grams)	<12,000	97 (39.1)
	12,000-13900	86 (34.7)
	14,000-18,000	65 (26.2)
Breastfeeding	2 years	240 (98.8)
	<2 years	8 (3.2)
Nutrition status	Well-nourished	248 (100.0)
	Mal-nourished	0 (0.0)
Number of U5C	1	118 (47.6)
	2	114 (46.0)
	3	16 (6.5)

4.3 Social-Economic Characteristics of the Surveyed Households

The social economic characteristics of the surveyed households are income level of the household in monthly basis, the observed house building materials and hand washing facilities. Nearly half of the interviewed caretakers reported to have the low income and only 9.6% had high income. Of the interviewed households, more than half (59.7%) had floors made of mud, 37.5 of the surveyed houses had walls made of mud and 76.2% of the houses have iron roofing (Table 3).

4.4 Diarrhea Episodes among Under-five years in the Past 3 months

The under-five year's children diarrhea episodes were assessed in a maximum of a recall period of three months before the survey. The overall diarrhea episodes of the child within the three months before the study were 24.6% (Table 4).

4.5 Relationship Between Hand-washing Practices and the Occurrence of Diarrhea

The results showed that most of the caretaker's washed hands with water and soap after using toilet, however they less likely washing hands with soap before food preparations, before eating and after washing a defecated child. Among the caretakers who did not washed hands after visiting toilet 40.0% of their children had a diarrhea episode compared to 22.5% of children whose caretakers washed hands after toilet ($\chi 2=4.366$, P=0.037) (Table 5).

Poor hand washing behavior of the caretakers after cleansing the child from defecation was also the linked to child's diarrhea; 33.3% compared to 18.2% from caretakers who washed hands after cleansing the child from defecation ($\chi 2=7.494$, p=0.006). Hand washing before eating had significant relation with reduced number of diarrhea episode compared to not washing hands before eating (23.5% vs 80%; p=0.014). Other hand washing practices at critical times had no significant association with diarrhea episodes among under-five children (Table 5).

Table 3 **Socio-economic Characteristics of the Surveyed Households (n=248)**

VARIABLE	CATEGORY	(n%)
Family income per month	Low	112 (45.2)
	medium	112 (45.2)
	High	24 (9.6)
Floor material	Mud	148 (59.7)
	Cement	80 (32.3)
	Tiles	14 (5.6)
	Wood	4 (1.6)
	Carpet	2 (0.8)
Wall material	Mud	93 (37.5)
	Baked Bricks	55 (22.2)
	Sun dried bricks	46 (18.5)
	Cement blocks	26 (10.5)
	Timber	11 (4.4)
	Grass	17 (6.9)
Roofing Materials	Iron sheets	189 (76.2)
	Grass	59 (23.8)
Hand washing place	Yes	95 (38.3)
	No	153 (61.7)
Soap for hand washing	Yes	88 (35.5)
	No	160 (64.5)
Running water	Yes	74 (29.8)
	No	174 (70.2)

Table 4 **Under-five year's diarrhea episodes in the past three months (n=248)**

VARIABLE	CATEGORY	n (%)
Diarrhoea in the Past 2 Weeks	Yes	25(10.1)
	No	223(89.9)
Diarrhoea in the Past 1 Month	Yes	11(4.4)
	No	237(95.6)
Diarrhoea in the Past 2 Months	Yes	17(6.9)
	No	23(93.1)
Diarrhoea in the Past 3 Months	Yes	21(8.5)
	No	227(91.5)
Diarrhoea at 2weeks or 1 month, or 2 months or 3 months before Study	Yes	61(24.6)
	No	187(75.4)
Does HH has more than 1 >5yrs Child?	Yes	130 (52.4)
	No	118 (47.6)
HH with unselected child who got diarrhoea	Yes	21 (8.5)
	No	227 (91.5)
The first child to get diarrhoea	Selected	42 (16.9)
	Unselected	19 (7.6)
	No diarrhoea cases	187 (75.4)

Table 5 **Caretakers' Hand washing Practices associated with diarrhea (n=248)**

VARIABLE	CATEGORY	DIARRHEA +VE	P. VALUE

Hand wash after toilet	Yes (n=218)	49 (22.5%)	0.037
	No (n=30)	12 (40.0%)	
Hand wash before eating	Yes (n=243)	57 (23.5%)	0.014[#]
	No (n=5)	4 (80.0%)	
Hand wash after job/farm	Yes (n=111)	26 (23.4%)	0.122
	No (n=137)	35 (25.5%)	
Hand wash after eating	Yes (n=206)	47 (22.8%)	0.149
	No (n=42)	14 (33.3%)	
Hand wash before food preparation	Yes (n=109)	32 (29.4%)	0.726
	No (n=105)	27 (25.7%)	
Hand wash before child's food prep	Yes (n=132)	35 (26.5%)	0.454
	No (n=116)	26 (22.4%)	
Hand wash before changing diapers	Yes (n=109)	32 (29.4%)	0.123
	No (n=139)	29 (20.9%)	
Hand wash after changing diapers	Yes (n=111)	26 (23.4%)	0.699
	No (n=137)	35 (25.5%)	
Hand wash after washing the defecating child	Yes (n=143)	26 (18.2%)	0.006
	No (n=105)	35 (33.3%)	

[#] *Fisher's exact*

4.6 Relationship between Drinking water Treatment, Storage, Withdrawal and the occurrence of Diarrhea

Poor drinking water management was found to be among the sources for the increased diarrhea episodes of the under-five years children. Caretakers who reported to drink the untreated water, 28.0% of their children got diarrhea compared to 15.2% from caretakers

who reported to drink the treated water($\chi 2$=4.326, p=0.038). Caretakers who reported to use any cup; 39.5% of their children got diarrhea and caretakers who use the same cup for drawing and drinking water; 33.3% of their under-five years children were suffering from diarrhea episodes compared to 18.9% of those who used special cup for drawing only ($\chi 2$=9.576, p=0.008). Other factors concerned with drinking water treatment, storage and withdrawal were not associated with the occurrence of diarrhea (Table 6).

4.7 Household Fecal Disposal Practices Associated with Diarrhea.

The results of this study showed that the improper human feces disposal practices were found to be the source for the increased diarrhea episodes among under-five year's children. Caretakers who reported throwing child feces in the farm/garden near the living place, 47.1% of their under-five years children suffered from diarrhea compared to 25.8% of those who reported to burry child feces compared and 19.1% of those who reported to throw the child feces in the toilet. Other factors concerned with human feces disposal practices did not show association with the under-five year's children diarrhea (Table 7).

4.8 Child Feeding Practices Associated with Child's Diarrhea Episodes

The results of this study showed that poor management of child's food was among the factors contributing to under-five year's children diarrhea episodes. Caretakers who wash hands with water only before preparing the child's food, 38.5% of their children got diarrhea, and caretakers who did not wash hands at all before child's food preparations, 54.5% of their children got diarrhea compared to 16.7% of child's diarrhea cases from the caretakers who washed hands with water and soap before child's food preparations. Furthermore, 37.9% of children from caretakers who reported to wash hands with water only before feeding the child got diarrhea compared to 16.9% from caretakers who reported to wash hands with water and soap before feeding the child. However, other factors regarding child feeding practices were not associated with the occurrence of diarrhea among children (Table 8).

In the regression analyses it was found that the practices of washing hands without soap and or not washing hands when preparing food for the children had increases occurrence of diarrhea episods (OR 2.4 and 4 3, adjusted OR 1.5 and 5) (Table 9).

Table 6 **Hygiene practices for Drinking Water treatments, Storage and Withdrawal (n=248)**

VARIABLE	CATEGORY	DIARRHEA +VE	P. VALUE
Drinking water storage	Always (n=164)	34 (20.7%)	0.089
	Sometimes (n=67)	20 (29.9%)	
	No (n=17)	7 (41.2%)	
Drinking water container	Covered (n=221)	53(24.0%)	0.336
	Open Bucket (n=9)	1 (11.1%)	
	Other Bucket(n= 1)	0 (0.0%)	
	Not stored (n=17)	7 (41.2)	
Drinking water withdrawal	Special cup (n=169)	32 (18.9%)	0.010
	Any cup (n=43)	17 (39.5%)	
	Drawing cup(n=36)	12 (33.3%)	
Drink the water used for other activities	Yes (n=59)	25 (42.4%)	0.000
	No (n=189)	36 (19.0%)	
Enjoy Treated Drinking Water taste	Yes (n=51)	16 (31.4%)	
	No (n=59)	17 (28.8%)	0.201
	I don't know (n=138)	28 (20.3%)	
Water Fetching time	<30 minutes (n=146)	40 (27.4%)	0.221
	>30 minutes (n=102)	21 (20.6%)	
Water sources	Piped water (n=247)	60 (24.3%)	0.079
	Well (n=1)	1 (100.0%)	
Drinking Water	Yes (n=66)	10 (15.2%)	0.038

Treatment	No (n=182)	51 (28.0%)

Table 7 **Household Fecal Disposal Practices Associated with Diarrhea (n=248)**

VARIABLE	CATEGORY		DIARRHEA +VE	P.VALUE
Family toilet	Improved	(n=119)	24 (20.2%)	0.221
	Unimproved	(n=99)	30 (30.3%)	
	No toilet	(n=30)	7 (23.3%)	
Distance to the toilet from house	< 10m	(n=102)	18 (17.6%)	0.157
	10-50m	(n=107)	33 (30.8%)	
	>50m	(n=9)	3 (33.3%)	
Toilet condition	Clean	(n=84)	18 (21.4%)	0.083
	Moderate	(n=126)	31 (24.6%)	
	Dirty	(n=8)	5 (62.5%)	
Child feces disposal place	Toilet	(n=152)	29 (19.1%)	0.003
	Burry	(n=62)	16 (25.8%)	
	Throw away	(n=34)	16 (47.1%)	

Table 8 **Child feeding practices associated with diarrhea among children (n=248**)

VARIABLE	CATEGORY	DIARRHEA +VE
Hand Washing before Child's Food Preparation	Water and Soap (n=174)	29 (16.7)
	With water only (n=52)	20 (38.5)
	Not wash hands (n=22)	12 (54.5)
Child's food Storage Utensils	In the Thermos (n=161)	39 (24.2)
	Other containers (n=87)	22 (25.3)
Hand Washing before Feeding the Child	With water only (n=87)	33 (37.9)
	Water and soap (n=154)	26 (16.9)
	Not wash hands (n=7)	2 (28.6)

Table 9 **Regression analysis on child feeding practices associated with diarrhea (n=248)**

VARIABLE	**CATEGORY**	**Diarrhea n(%)**	**COR**	**AOR**	**P. VALUE**
Hand washing before preparing child's food	With water and soap	29(16.7)	1		
	With water only	20(38.5)	2.363	1.481	0.010
	Not washing hands	12(54.5)	4.335	5.001	0.001
Complimentary food storage	Other utensils	22(25.3)	1.059	-	0.853
	In the thermos	39(24.2)	1	-	
Hand washing before feeding	With water and soap	26(16.9)	1		0.000
	With water only	33(37.9)	2.903	2.475	0.000

the child	Not washing hands	2(28.6)	-

CHAPTER FIVE

5.0: DISCUSSIONS

This study aimed at assessing the caretakers hygienic practices associated with the occurrence of diarrhea among children of under-five year's in semi-pastoralist society in Siha District. The study comprised of 248 caretakers of the children of below five years from four wards, and eight villages of the Siha District. The study reveals that, poor hygienic practices behavior among the under-five years children caretakers was associated with the occurrences of diarrhea among children.

5.1 Children of Under-five years old Diarrhea Episodes in the Past three months Before the Survey

This study assessed the caretakers hygienic practices associated with the occurrence of diarrhea among under-five year's children in semi-pastoralist community. The prevalence of reported diarrhea among the under-five year's children within 3 months prior to the study was found to be 24.6%. These results are slightly higher than the findings from Mwanza city were diarrhea prevalence among children of non-nomadic families was reported to be 20.4% (Silas Kabhele et al, 2018). However, the results are slightly lower to diarrhea prevalence (26.1%) among children in nomadic community in Hadaleala District, Afar Region of northeast Ethiopia (Woldu et al, 2016). The possible explanation for the difference could be the variation in the socio-demographic characteristics of the study subjects in non-nomadic community, socioeconomic development, people's living style, and behavioral characteristics among semi pastoralistic, nomadic and non-nomadic families.

5.2 Hand Washing Practices Associated with Diarrhea Episodes

This study found out that the risk of diarrhea were found among children from the caretakers' who did not wash hands with water and soap after using the toilet, and after washing the child from defecation. The results of this study are slightly similar to the findings from a study performed in Nigeria in which, the risk of diarrhea was significantly higher among children whose mothers did not wash hands with water and soap after leaving the toilet (Oloruntoba et al, 2014). The results of this study are also similar to those reported from a study done in Longido and Monduli where it was found out that the majority of people did not wash their hands even at the critical moments (Mshinda et al, 2017). The reason for poor hand hygiene after using the toilet could be due to low level of education, lack of soap due to poor economic status as well as semi-pastoralist living style and culture.

5.3 Drinking water Treatments, Storage and Withdrawal

In this study, more cases of the under-five year's children diarrhea were reported from the households where members used any cup (39.5%) and those who used the same cup to draw drinking water from storage container (33.3%). Our findings from are similar to the study performed in Ibadan, Nigeria which showed that there were an increased cases of diarrhea among children whose caregivers/mothers collected drinking water from the storage by dipping in any container (Oloruntoba et al, 2014). Furthermore, boiling water for drinking purposes could also minimize the problem of diarrhea although water may be re-contaminated during cooling or withdrawal. This study reveals that, only 26.6% of the interviewed caretakers reported to treat their drinking water which shows that the majority of people do not treat their drinking water. In this study the number of the caretakers who reported to treat their drinking water is low compared to 49.5% of the respondents from Mkuranga District who was reported to treat the drinking water (Kakulu, 2012). Reasons for the difference could be life style and settings of the area Mkuranga being of a small town and Siha a rural area.

5.4 Fecal Disposal Practices Associated with Diarrhea among Children

This study found out that improper child's feces disposal practices were among the factors for the increased odds (OR=3.338; CI 95% 1.578-7.063, p=0.002) for occurrence

of diarrhea episodes among the under-five years children. The percentage of caretakers who throw child feces in the farm/garden, 13.1% found in this study is slightly lower compared to that reported from Longido and Monduli which was 80.0% and 94.4% respectively. This high difference could be due to the nomadic life of people in Moduli and Longido. In our study open defecation was reported in 12.1% of households which is lower compared to 44.0% and 55.6% reported from Longido and Monduli respectively (Mshinda et al, 2017). The reasons for the differences could be environmental differences, level of education and hygiene awareness. Furthermore even though the areas are closer to our study site, people in Longido and Monduli are pastoralists who may practice nomadic life style. However, other practices concerned with human feces disposal were not associated with diarrhea among the under-five year's children.

5.5 Child Feeding Practices Associated with Diarrhea among Children

Caretakers who have the behavior of preparing the child's food without washing hands, 38.5% of their children got diarrhea and who washed hands with water only 54.5% of their children got diarrhea. Findings from this study was slightly higher compared to those from a study performed in Bangladesh where they found that 15% of the caretakers who did not wash hands before child's food preparations their children got diarrhea (Nizame et al, 2013). Reasons for the difference could be due to low level of hygiene awareness, lack of education, poor environment, water shortage, lack of soap and semi nomadic way of living. Furthermore, this study found out that the increased diarrhea cases among children (37.9%) were from the caretakers who washed hands with water only before feeding children. The findings of this study was slightly higher from the findings of the study conducted in Nepal where they found that 25.8% of children who are given complimentary foods had diarrhea due to caretakers not washing their hands before they start to feed their children (Acharya et al, 2017). Reasons for the difference between the two studies could be behavioral characteristics of the respondents, low level of hygiene awareness, lack of education, poor environment, water shortage and lack of soap.

5.6 Limitations of the Study

1. Results from this study is based on semi-pastoral community hence can be generalized to similar communities only due to their cultures and life style.
2. Some of the information obtained through questionnaire relied on the caretakers self-reporting which might have involved recall bias. This challenge was minimized by doing verification of information from different sources such as observation. The theme of the study was explained clearly until understood before a respondent gave consent.
3. Caretakers were asked on diarrhea episodes three months prior to the study which could have introduced recall bias. This was broken into three question starting from past seven day past month and past three months.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study reveals that, poor hygienic practices behavior among the under-five years children caretakers were associated with the occurrences of diarrhea among children. Hand washing after toilet, hand washing after washing the child from defecation, hand washing before child's food preparations and hand washing before child feeding were found to be more effective in protecting children against diarrhea. Furthermore, the proper practice of drinking water withdrawal to minimize water contamination was also found to protect children against diarrhea and the throwing of child feces in the toilet also protected children from diarrhea episodes.

6.2 Recommendations

The following recommendations should be taken into consideration;

i. District health management teams in collaboration with other departments should establish health education programs in order to increase hygiene practices habits especially to the semi-pastoralists communities

ii. The villages' water authorities should extend the household piped water connections; public taps, improved sanitation facilities like flush toilets to a confined system and should also provide hygiene education to address all necessary hygiene practices.

6.3 Dissemination plan

This study will be published in mid-2019 so as to give scholars a room of knowing what was unknown before. A dissertation will be produced for submission. Thereafter, Siha District together with the eight villages where the study was conducted will be given a dissemination copy of report.

6.4 Future perspective

The study focused on assessing the caretakers hygienic practices towards occurrence of diarrhea to under-five year's children in semi-pastoralist society in Siha District. There is much more that has to be studied which were not captured due to study design, financial constraint and time like the economic level of the household, semi-pastoralist cultural aspects, caretakers level of education, number of people in the household, and the level of the hygiene awareness among the caretakers in association with the diarrhea prevalence among the under-five years children. Therefore, in the effort to reduce the diarrhea burden among the under-five years children different studies should be conducted on those areas.

REFERENCES

Acharya, A., Sadasivan, J., Pradhan, N., Majumdar, A., Ojha, N., Babu, S., and Bose, S (2017) Food Degradation and Foodborne Diseases: A Microbial Approach. Indian Institute of Science Education and Research (IISER) Journal 13: 977

Agustina, R., Sari, T., Saltroamidjojo, S., Bovee-Oudenhoven, I., Feskens, E and Kok, F (2013) Association of Food-hygiene Practices and Diarrhea prevalence among Indonesian young Children from low socio-economic urban areas. BioMed Central Public Health Journal 13:977

Belay, H., Dagnew, Z and Abebe, N (2016) Small scale Water Treatment Practice and associated factors at Burie Zuria Woreda Rural Households, Northwest Ethiopia. BioMed Central Public Health Journal 16:887

Bello I, Ismail M, Kabbashi N (2016) Solid Waste Management in Africa: A Review. International Journal of Waste Resources 6:216

Cevizci, S., Uludag, A., Topaloglu, N., Babaoglu, U., Celik, M and Bakar, C (2015) Developing students' hand hygiene behaviors in a primary school from Turkey: A School Based health education study. International Journal of Medical Science and Public Health 4(2):155–61

Ferdous, F., Das, S., Ahmed, S., Fahmida, D., Latham, J., Christi, M., Ud-Din, A., Azmi, I., Talukder, K and Faruque, A (2013) Severity of diarrhea and malnutrition among under five years old children in rural Bangladesh. American Journal of Tropical Medicine and Hygiene 89(2):223-8

Freeman, M., Stocks, M., Cumming, O., Jeandron, A., Higgins, J., Wolf, J., Pruss-Ustun, A (2014) Bonjour, S., Hunter, P., Fewtrell, L and Curtis, V (2014) Hygiene and Health: Systematic Review of hand washing Practices worldwide and update of health effects. *Tropical* Medicine and International Health *19(8): 906–916. doi: 10.1111/tmi.12339*

Ghislaine, R., Kelly, P. and Clasen, T (2016) Consistency of use of effectiveness of Household Water Treatment Practices among urban and rural populations claiming to treat their water at home; A case study in Zambia. American Journal of Tropical Medicine and Hygiene 94(2):445-55

Gizaw, Z., Woldu, W and Bitew, B (2017) Child feeding practices and diarrheal disease among children less than 2 years of age of the nomadic people in Hadaleada District, A far Region, Northeast Ethiopia. International Breastfeeding Journal 12:24

Ibrahim, J., Sufiyan, M., Olorukooba, A., Gobir, A., Adam, H and Amadu, L (2016) Knowledge, Attitudes, and Practices of household water purification among caregivers of under-five children in biye community, Kaduna State. Archives of Medicine and Surgery Journal 1(2):35-41

Islam, M., Ercumen, A., Ashraf, S., Rahman, M., Shoab, A., Luby, S and Unicomb, L (2018) Unsafe disposal of feces of children < 3 years among households with latrine access in rural Bangladesh: Association with household characteristics, fly presence and child diarrhea. PLoS ONE journal 13(4):e0195218

Kakulu, R (2012) Diarrhoea among Under-Five Children, Household Water Treatment and Safe Storage Factors in Mkuranga District. Masters thesis, Muhimbili University of Health and Allied Sciences

Kamara, J., Galukande, M., Maeda, F., Lubaga, S and Renzaho, A (2017) Understanding the Challenges of Improving Sanitation and Hygiene Outcomes in a Community Based Intervention: A Cross-Sectional Study in Rural Tanzania. International Journal of Environmental Research in Public Health 14 (6): 602

Kamm, K., Feikin, D., Bigogo, G., Aloi, G., Audi, A., Shar, M., Yu, J., Breiman, R and Ram, P (2014) Associations between presence of handwashing stations and soap in the home and diarrhea and respiratory illness, in children less than five years old in rural western Kenya. Tropical Medicine and International Health 19(4): 398–406

Kumar, S. and Subita, L (2012) Diarrheal diseases in developing countries: A situational analysis. Kathmandu University Medical Journal 10(2):83-88

Kwang, L., Ercumen, A., Pickering, A., Unicomb, J., Davis, J and Luby, S (2016) Hand and object-mouthing of rural Bangladesh children 3-18 months. International Journal of Environmental Research on Public Health 13(6): 563

Mashoto, o., Malebo, H., Msisiri, E and Peter, E (2014) Prevalence, one week incidence and knowledge on causes of diarrhea: household survey of under-fives and adults in Mkuranga district, Tanzania. BioMed Central Public Health 14:985

Mattiol, M., Pickering A., Gilsdorf, R., Davis, J and Boehm, A (2013) Hands and Water as vectors of diarrheal pathogens in Bagamoyo, Tanzania: Journal of Environmental Science and Technology 47(1):355-63

Meena, P., Peter, G., Allen, L., Cohen, M., Christian-Smith, J and Smith, C (2010) Clearing the waters: A focus on water quality solutions. United Nations Environment Program and Pacific Institute Nairobi Kenya

Mshida, H., Kassim, N., Kimanya, M and Mpolya, E (2017) Influence of Water, Sanitation and Hygiene Practices on Common Infections among Under-five Children in Longido and Monduli Districts of Arusha, Tanzania. Journal of Environmental and Public Health. Available at https://doi.org/10.1155/2017/9235168 accessed on 21st September 2018

Nizame, F., Unicomb, L., Sanghvi, T., Roy, S., Nuruzzaman, M., Ghosh, P., Luby, S. (2013). Handwashing before food preparation and child feeding: A missed opportunity for hygiene promotion. American Journal of Tropical Medicine and Hygiene, 89(6): 1179-1185. Available at https://doi.org/10.4269/ajtmh.13-0434

Ogbo, F., Agho, K., Ogeleka, P., Woolfenden, S., Page, A., Eastwood, J and Global Child Health Research Group (2017) Infant feeding practices and diarrhea in sub Saharan African countries with high diarrhea mortality. PLoS ONE Journal 12 (2): e0171792

Ogbo, F., Nguyen, H., Naz, S., Agho, K and Page, A (2018) The association between infant and young child feeding practices and diarrhea in Tanzanian Children. Journal of Tropical Medicine and Health 46(2) 642-51

Oloruntoba, E., Folarin, T and Ayede, A (2014) Hygiene and sanitation risk factors of diarrheal disease among under-five children in Ibadan, Nigeria. Journal of African Health Science 14(4): 1001-1011

Panda, M and Vashisht, B (2015) Hand Washing Techniques in households in a rural area of Haryana India. Medical Journal of Dr. D. Y. Patil Vidyapeeth 8(3):419-20

Park, S., Kwak, T and Chang, H (2010) Evaluation of the food safety training for foodhandlers in restaurant operations. Journal of Nutrition Research and Practice 4 (1): 58–68. Available at URL: https://www.researchgate.net/publication/41670033 Accessed on 24/7/2018

Pauschert, D., Gronemeier, K and Bruebach, K (2012) Urban Water and Sanitation Poverty in Tanzania-Evidence from the field and recommendations for successful combat strategies. GIZ. Dar es Salaam, GIZ. Available at URL: https://www.giz.de/fachexpertise/downloads/giz2012-en-urban-water-poverty-tanzania.pdf Accessed on 21st September 2018

Preeti, P., Sahoo, K., Biswa, D and Dasgupta, A (2016) Unsafe Disposal of Child feces: A community based study in a Rural Block in west Bengal, India. Journal of Preventive Medicine and Public Health 49(5): 323-28

Silas, K., Moses, A., Stephen K., Ainory G (2018) Prevalence and Factors Associated with Diarrhea among Children between 6 and 59 months of Age in Mwanza City, Tanzania. Journal of Tropical Pediatrics 64(6): 523-530

Stedman-Smith, M., Catty, L., Scott, F., Kingsbury, D., Shakya, S., Scofield, J and Slenkovich, K (2015) Outcome of a pilot hand hygiene randomized cluster trial to reduce communicable infections among US office-based employees. Journal of Occupational and Environmental Medicine 57(4): 374–80

Thomas, J., Holbro, N and Young, D (2013) A review of Sanitation and Hygiene in Tanzania Available at URL:https://assets.publishing.service.gov.uk/media/57a08a2fed915d3cfd000628/ tanzaniasanitationreview.pdf Accessed on 27th September 2018

United Republic of Tanzania. Demographic and Health Survey and Malaria Indicator Survey, 2015/2016 Available at URL: https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf. Accessed on 24/7/2018

WHO/UNICEF report, (2017) Progress on Drinking Water Sanitation and Hygiene. http://www.who.int/mediacentre/news/releases/2017/launch-version-report-jmp-water-sanitation-hygiene.pdf

Woldu, W., Destaw, B., Gizaw, Z (2016) Socio-economic factors associated with diarrheal diseases among under-five children of the nomadic population in northeast Ethiopia. Journal of tropical Medicine and Health 44(1) DOI: 10.1186/s41182-016-0040-7

Wolf, J., Matthew, C., Thomas, C., et al. (2014) Assessing the impact of drinking water and Sanitation on diarrheal diseases in low and middle income settings; A systematic review and meta-regression. Journal of Tropical Medicine and International Health 19(8) 928 - 42

World Bank (WB) 2014 Child's feces disposal in Tanzania. Available at URL: http://documents.worldbank.org/curated/en/455821468000919135/Tanzania-Child-feces-disposal Accessed on 17th September 2018

World Health Organisation (WHO) (2016). WHO International scheme to Evaluate Household Water Treatment Technologies .WHO library Available at URL: http://apps.who.int/iris/bitstream/handle/10665/204284/9789241509947_eng.pdf?sequence Accessed on 27th August, 2018

World Health Organisation (WHO), 2018; Use of basic and safely managed drinking water services Available at URL: https://www.who.int/news-room/fact-sheets/detail/drinking-water Accessed on_20th July 2018

Appendices

Appendix 1: Informed consent form-English version

MUHIMBILI UNIVERSITY OF SCIENCE AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS

Title: Caretakers Hygiene Practices Associated with the occurrence of Diarrhea among under-five years Children in Semi-Pastoralist Society in Siha District in Kilimanjaro Region.

ID NO._____

Consent to Participate in this Study

Greetings! My name is _____I am working in this research project with the objective of assessing Caretakers Hygiene Practices associated with the occurrence of Diarrhea among under-five years children. We plan to talk with 248 mothers/caretakers in their household in this district. We are asking you to take part in this study because you are among the persons taking care for children below five years of age. You have been selected by chance. We want you to understand the purpose of this study and your role so you may decide if you want to join. If you join we will ask you to sign this paper (if you cannot read/write, make your mark in front of a witness). Please ask us to explain any words or information that you may not understand.

Information about the Research

If you participate we will interview you. We will ask you about your background, about your under-five years children's diarrhea episode, hand washing practices, child feeding practices, safe drinking water practices, and the fecal disposal practices. The interview will consume about 20 minutes.

Possible Risks

Our interview will be private in order to maintain your privacy and the study records. However, it is possible that others will know that you have joined the Research, and because of this, others may treat you unfairly. The interview questions may cause you to feel some anxiety therefore you may refuse to answer any question if you don't feel or you may end the interview at any time.

Possible Benefits

The study has no direct benefits to you but the results of this study will help to improve interventions on the reduction of child's diarrhea episodes and caretaker's hygiene practices.

Decision to join the Research

You are free to decide either to take part in this research or not.

Confidentiality

We will do our best to protect information about you and your part in this research. We will interview you in the private place and we will not write your name on the interview form or in any report, only the study staffs and investigators will know your answers to the question asked.

Compensation

You will not receive any money by joining this study.

Leaving the Research Study

You may leave the study at any time if you wish, and if you choose to take part, you can change your mind any time and withdraw, if so please tell the research Interviewer why you wish to leave.

Your rights as a participant

This Research has been reviewed and approved by the Muhimbili University of Health and Allied Sciences-Research and Publication Committee.

Whom to contact

If you ever have questions about this study, you should contact the study coordinator or Research Investigator Dafrosa P. Lyimo, Muhimbili University of Health and Allied Sciences (MUHAS) P.O BOX 65011 Dar Es Salaam, mobile No.0763914159. Questions about your rights as a participant, you may contact/call Dr. Bruno Sunguya, Chairman of the Collage Research and Publications Committee, P.O Box 65001, Dar es Salaam. Tel: 2150302-6 and Dr. Gloria Sakwari, who is the supervisor of this study (0767 591 202).

Do you agree?

Participant agrees

Participant disagree

I_____ have read/understand the contents in this form. I agree to participate in this study.

Signature of the participant _____

Signature of witness (if participant cannot read) _____

Signature of the Research Assistant _____ Date

Appendix 2: Fomu ya ridhaa

FOMU YA RIDHAA YA KUSHIRIKI UTAFITI TOLEO LA KISWAHILI

CHUO KIKUU CHA AFYA NA TIBA MUHIMBILI

KURUGENZI YA TAFITI NA MACHAPISHO

UTAFITI KUHUSU TABIA ZA KIAFYA ZA WAZAZI/WALEZI NA KUENEA KWA UGONJWA WA KUHARISHA KWA WATOTO CHINI YA MIAKA MITANO KATIKA JAMII ZA WAFUGAJI KATIKA WILAYA YA SIHA, MKOA WA KILIMANJARO

Ridhaa ya kushiriki katika utafiti huu

Salaam! Mimi naitwa_____. Ninafanya utafiti kuhusu Tabia za kiafya za Wazazi/Walezi na Kuenea kwa Ugonjwa wa Kuharisha kwa watoto chini ya miaka mitano.

Tumepanga kufanya mahojiano na Wazazi/Walezi wa watoto walio katika umri chini ya miaka mitano kwa kaya 248 ambazo tutazipata kwa njia isiyo ya upendeleo yaani bahati nasibu. Kaya yako imekuwa miongoni mwa kaya hizo hivyo tunakuomba ridhaa yako ya ushiriki katika mahojiano haya.

Tungependa uelewe malengo ya utafiti huu na umuhimu wa kushiriki utafiti huu ili uweze kuamua ama kukubali, ama kukataa. Tunakuomba kutia sahihi kwenye form hii endapo utakubali kushiriki katika utafiti huu au kama hujui kuandika utaweka alama ya dole gumba mbele ya shahidi.

Maelezo kuhusu utafiti huu

Endapo utakubali kushiriki tutakuuliza maswali yaliyopo katika dodoso hili. Tutakuuliza kuhusu taarifa binafsi pamoja na maswali kuhusu vipindi vya kuharisha mtoto wa chini ya miaka mitano, vile vile tutakuuliza maswali kuhusu unawaji wa mikono, maandalizi na uhifadhi wa chakula cha mtoto, maji ya kunywa, na uhifadhi/utupaji wa kinyesi na taka.

Madhara

Hakuna wasiwasi wa madhara yoyote yatokanayo na utafiti huu.

Faida ya utafiti huu

Hakuna faida ya moja kwa moja itakayoipata kutokana na wewe kushiriki katika utafiti huu isipokuwa majibu utakayoyatoa yatatusaidia kwenye mipango na mikakati ya kuongeza uelewa kwa wazazi/walezi juu ya matendo yanayowasababishia watoto chini ya miaka mitano kuharisha.

Uamuzi wa kushiriki utafiti huu

Unayo haki ya kuamua kushirili ama kukataa kushiriki utafiti huu.

Uamuzi wa kujitoa kwenye utafiti huu.

Unao uhuru wa kukataa baadhi ya maswali au kukataa kushiriki katika utafiti huu wakati wowote. Ikiwa utaamua kutokushiriki katika utafiti huu uamuzi wako wa kutoshiriki hautakuwa na madhara yoyote kwako. Unaweza pia kujitoa katika utafiti huu hata baada ya kutoa ridhaa yako hapo awali. Kwa kujitoa kwako hakuna adhabu yoyote ile wala haiwezi kukunyima haki yoyote unayostahili kupata katika jamii.

Usiri

Nakuhakikishia kuwa jina lako halitaandikwa mahali popote kwenye fomu hii wala taarifa zote tutakazozichukua hazitawekwa bayana kwa mtu yeyote isipokuwa wanaofanya kwenye utafiti

Mawasiliano

Kama una swali lolote unaweza kuwasiliana na ndugu Dafrosa P. Lyimo kwa kutumia anuani ya chuo kikuu cha Afya na Tiba Muhimbili S.L.P 65011 Dar Es Salaam; namba yangu ya simu 0763 914 159. Ukiwa na swali lolote kuhusu haki yako ya kushiriki utafiti huu unaweza kumpigia Dr. Bruno Sunguya, ambaye ni mwenyekiti wa kamati ya chuo cha utafiti na machapisho, S.L.P 65001 Dar es Salaam. Simu namba 2150302-6 na Dr. Gloria Sakwari, ambaye ni msimamizi wa utafiti huu kwa simu namba 0767 591 202.

Je unakubali kushiriki katika utafiti huu?

Mhusika amekubali _____

Muhusika amekataa _____

Mimi _____ nimesoma na kuelewa maelezo yote yaliyo katika fomu hii. Nakubali kushiriki katika utafiti huu.

Sahihi ya mhojiwa _____

Sahihi ya shahidi (endapo mhusika hajui kusoma) _____

Sahihi ya mtafiti mwandamizi _____

Tarehe ya kusainiwa ridhaa _____

Appendices 3: Questionnaire in English version

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
SCHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCES

QUESTIONNAIRE FOR ASSESSMENT OF CARETAKERS HYGIENE PRACTICES AND PREVALENCE OF DIARRHEA AMONG UNDER-FIVE YEARS IN SEMI-PASTORALIST SOCIETY IN SIHA DISTRICT IN KILIMANJARO REGION, TANZANIA.

ID NO_____DATE OF INTERVIEW_____

VILLAGE_____WARD_____

NAME OF RESEARCH INTERVIEWER_____

SECTION A: DEMOGRAGHIC CHARACTERISTICS OF THE RESPONDENTS.

1	Respondent's relationship to the child (Only one respondents)	Mother 1, father 2, Grandmother/father 3, others 4
2	Sex (don't ask the respondents)	Male 1, female 2
3	Age of the respondent(years) at last birthday	
4	Marital status	Single 1, Married 2, Divorced3, widow 3, Cohabiting 4
5	Level of education	None 1, primary 2, post

	(the highest level of education reached)	primary 3
6	How many people live in your household?	
7	Household income per month	
8	Household unit(floor), record observation	Sand 1, Wood 2, Tiles 3, Cement 4, carpet 5, others 6
9	Wall materials record observation	Grass 1, pole and mud 2, sun dried bricks 3, Backed bricks 4, wood timber 5, cement blocks 6
10	Roofing materials	Grass/Thatch/Mud 1, Iron sheets 2, Tiles, concrete 4, others 5
	SECTION B: HAND WASHING PRACTICES AMONG CARETAKERS	
11	Do you wash hands?	Yes 1, /No 2
12	What do you normal use for hand washing i) After using toilet	With water and soap 1, with water only 2, Not washing hands 3
ii)	Before preparing food	With water and soap 1, with water only 2, not washing hands 3
iii	Before eating	With water and soap 1, with water only 2, Not washing hands 3
iv)	After changing the child's diaper	With water and soap 1, with water only 2, Not washing hands 3

v)	After work or cleanness	With water and soap 1, with water only 2, Not washing hands 3
13	Is there place for washing hands? Observe	Yes1, No 2
14	Is there soap in the place where you wash your hands?	Yes(observe) 1, No 2
15	Do you use running water for hand washing?	Yes(observe) 1, NO 2
	SECTION C:DRINKING WATER SOURCES, TREATMENT, HANDLING AND STORAGE PRACTICES	
16	What is the main source of drinking water for members of your household?	Piped water 1, Well 2, others(specify) 3
17	How long does it take to go there, get water and come back?	Less than 30 minutes 1, more than 30 minutes 2
18	How much water do you get per day?(liters)	
19	Do you do anything to make water safer for drink?	Yes 1, No 2
20	What do you usually do to make water safer to drink? (do not read for her/him)	Boiling 1, water guard 2, others (specify) 3
21	Why do you use this method for making water safer?	Cheap 1, I don't know other option 2, the method is effective 3, others (specify) 4
22	Why don't you treat your	Cost 1, I believe water is

	drinking water?	safe from the source 2, bad taste and smell 3, I used to drink untreated water nothing happens to us 4, others (specify) 5
23	Do you store water for drinking separately from water for other domestic purposes?	Always 1, sometimes 2, No 3
24	Which container do you store water for drinking(observe and write answers	Bucket with a lid 1, bucket without a lid 2, others 3
25	Do you use drinking water for other purposes?	Yes 1, No 2
26	How do you draw water from your container?	Special cup 1, use any utensil 2, the same cup used for drinking water 3
27	Do you enjoy the taste and smell of your treated drinking water?	Yes 1, No 2, I don't know 3
28	What kind of toilet facility do members of household usually used?	Improved with sewer sink 1, unimproved with open sewer 2, No toilet/bush 3
	SECTION D: HOUSEHOLD WASTE DISPOSAL PRACTICE	
29	How far is this toilet from where they live?(if possible observe)	less than ten meters 1, 10-50 meters 2, over 50 meters 3
30	Toilet-cleanness condition(observe)	Clean 1, moderate 2, Dirty 3
31	Where does your household's	Sewage system 1,

	domestic liquid waste discharge to (i.e water from cooking, washing, cleaning, but not including toilet)	Farm/garden 2, open place near the house 3
32	Where does the household's solid waste disposed?	Disposed in the special place 1, Burning or burying 2, open dumping 3
	SECTION E: CHILD DIARRHEA EPISODE	
33	How many children of under-five years are in this household? (select one without bias)	
34	Age of the child(selected child)	
35	Sex of the selected child	Male 1, female 2
36	Child's weight	
37	Does the child on breastfeeding or breast fed for two years before stop?	Yes 1, No 2
38	Nutrition status(observe MCH card)	Well-nourished 1, Malnourished 2
39	Have this child have diarrhea (diarrhea is stools that are more frequent and more liquid than usual)	
	In the past two weeks	Yes 1, No 2
	In the past one month	Yes 1, No 2
	In the past two months	Yes 1, No 2
	In the past three months	Yes 1, No 2
40	At the time your child was	Go hospital 1, give oral

	ill with diarrhea, how did you treat diarrhea for your child?	rehydration 2,home-made sugar salt solution 3, others
41.	For the household with more than one under-five years children, do the other children dot diarrhea?	Yes 1, No 2
42.	Who was the first to get diarrhea?	The selected child 1, The other child 2.

Appendix 4: Dodoso la utafiti kwa Kiswahili

CHUO KIKUU CHA AFYA NA TIBA MUHIMBILI

KITIVO CHA AFYA YA UMMA NA SAYANSI YA JAMII

DODOSO LA UTAFITI WA TABIA ZA KIAFYA ZA WAZAZI/WALEZI NA KUENEA KWA UGONJWA WA KUHARISHA KWA WATOTO WENYE UMRI CHINI YA MIAKA MITANO KATIKA JAMII ZA WAFUGAJI KATIKA WILAYA YA SIHA, MKOA WA KILIMANJARO, TANZANIA

NAMBA----------TAREHE YA MAHOJIANO----------

KATA ----------KIJIJI----------

JINA LA ANAYEHOJI----------

SEHEMU A: TAARIFA ZA MHOJIWA.

1. Mhojiwa (chagua anayehusika) Mama 1, Baba 2, Babu/Bibi 3, Mwingine 4 ( )

2. Jinsi (usimmulize) Me 1, Ke 2 ( )

3. Umri/ tarehe ya kuzaliwa _____

4. hali ya ndoa hajaoa/hajaolewa 1, Ameoa/ameolewa 2, wameachana 3, mjane/ mgane 4, kimada 5 ( )

5. Kiwango cha elimu (elimu ya juu aliyofika) Hana elimu rasmi 1, Elimu ya msingi 2,

Zaidi ya elimu ya msingi 3 ( )

6.Kaya hii ina jumla ya watu wangapi? _____

7.Kipato cha kaya kwa mwezi _____

8. Hali ya nyumba (sakafu) Udongo 1, Mbao 2, Vigae 3, Saruji 4, Kapeti 5

Nyinginezo 6 ( )

9. Ukuta wa nyumba (angalia na ujaze) Nyasi 1, Udongo 2, Matofali mabichi 3, Matofali yaliyochomwa 4, Mbao 5, Matofali ya saruji 6, Nyinginezo 7. ( ) 10.Paa (angalia na ujaze) Nyasi 1, Mabati 2, Vigae 3, Zege 4, nyinginezo 5 ( )

SEHEMU B: UNAWAJI WA MIKONO KWA WAZAZI/WALEZI

11. Je huwa unaosha mikono wakati gani ?

(Aseme mwenyewe kwanza)

Baada ya kutoka chooni 1, Kabla ya kula 2,

Baada ya kula 3, Kabla ya kupika 4,

Kabla ya kuandaa chakula cha motto 5,

Kabla ya kumbadilisha motto nguo 6,

Baada yakumbadilisha mtoto nguo 7,

Baada ya kumtawadha mtoto 8,

Maji ni haba sioshi mara kwa mara 9,

Baada ya kazi/shamba/bustan au usafi 10

12. Je huwa una nawa kwa kutumia nini

-Baada ya kutoka chooni Kwa maji na sabuni 1, Kwa maji peke yake 2,

Sioshi mikono kabisa 3 ( )

-Kabla ya kuanza kupika Kwa maji na sabuni1, Kwa maji peke yake 2,
Sioshi mikono kabisa 3 ( )

-Kabla ya kula Kwa maji na sabuni 1,Kwa maji peke yake 2,

Sioshi mikono kabisa 3 ( )

-Baada ya kumbadilisha mtoto nepi Kwa maji na sabuni 1, Kwa maji peke yake 2,

Sioshi mikono kabisa 3 ( )

13.Kuna eneo la kunawia mikono? Ndiyo (angalia) 1, Hapana 2 ( )

14. Kuna sabuni katika eneo la kunawia mikono? Ndiyo (angalia) 1, Hapana 2 ( )

15. Unatumia maji yanayotiririka kunawia mikono? Ndiyo (angalia) 1, Hapana 2 ( )

SEHEMU C: VYANZO VYA MAJI YA KUNYWA, UTAKATISHAJI WA MAJI YA KUNYWA NA UHIFADHI WA MAJI YA KUNYWA.

16. Nini chanzo kikuu cha maji ya kunywa cha kaya? Maji ya bomba 1, Maji ya kisiwa 2, nyinginezo(elezea) 3
( )

17.Mnatumia muda gani kwenda kuteka maji na kurudi? Chini ya dakika 30 1,

Zaidi ya dakika 30 2 ( )

18. Ni kiasi gani cha maji unateka kwa siku?(lita)_____

19. Unafanya kitu chochote cha kutakatisha maji ya kunywa? Ndiyo (nenda swali la 20) 1

Hapana (nenda swala la 22) 2 ( )

20. Unatumia njia ipi kutakatisha maji ya kunywa? Kuchemsha 1, Water guard 2, Nyinginezo (taja) 3
( )

21. Kwanini unatumia njia hiyo kwa kutakatishia maji ya kunywa? Ni rahisi 1, Ina matokeo mazuri 2, Nyingine (elezea) 3 .
( )

22. Kwanini hautakatishi maji ya kunywa?(aliyejibu-kuwa hatakatishi maji ya kunywa) Ni garama 1, naamini kuwa maji ni masafi siku zote 2, Yanakuwa na ladha mbaya na harufu 3, Mara zote tunakunywa hivi hivi na hakuna aliyepata madhara 4 Nyinginezo(elezea)5 ( )

23 Je unahifadhi maji ya kunywa tofauti na maji ya shughuli zingine? Kila wakati 1,

Siyo mara zote 2, hapana 3
( )

24. Ni chombo gani unatumia kuhifadhia maji ya kunywa?(angalia na ujaze)
Ndoo yenye mfuniko 1, Ndoo isiyo na mfuniko 2 ,Vifaa vingine(taja) 3
( )

25. Je unatumia maji ya kunywa kwa shughuli zingine? Ndiyo 1, Hapana 2
( )

26. Unachukua je maji ya kunywa kutoka kwenye chombo ulichohifadhia? Kikombe/chombo maalum 1, Chombo chochote 2, Kikombe cha kunywea maji 3
( )

27.Je unafurahia ladha ya maji ya kunywa yaliyotakatishwa? Ndiyo 1, Hapana 2

Sijui 3
( )

SEHEMU D: UHIFADHI NA UTUPAJI TAKA

28. Omba kuoneshwa choo cha kaya Kilichoboreshwa chenye slab1, Kisichoboreshwa ambacho hakina slab 2 , hakuna choo/vichaka
( )

29.. Choo kipo umbali gani kutoka mnapoishi? (Angalia) Chini ya mita 10 1, Kati ya mita 10-50 2, Zaidi ya mita 50 3 ( )

30. Usafi wa choo (angalia) Kisafi 1, Wastani 2, Kichafu 3 ( )

31. Maji machafu ya kuoshea vyakula wakati wa kupika, yaliyofanyia usafi unamwaga wapi? Shimo la maji taka 1, Shambani/kwenye bustani 2, Kando kando ya nyumba/jiko 3 ( )

32. Ni mahali gani unatupa takataka ngumu? Eneo/chombo-maalum cha kuhifadhia taka1, Kuchoma/kufukia 2, Kutupa eneo la wazi jirani na makazi 3 ( )

SEHEMU E: TAARIFA YA WATOTO NA MATUKIO YA MTOTO KUHARISHA.

33. Kaya hii ina watoto wangapi wenye umri chini ya miaka 5? (Chagua mmoja bila upendeleo) _____

34. Umri wa mtoto _____(andika kwa miezi)

35. Jinsi ya mtoto Me 1, Ke 2

36. uzito wa mtoto (andika kilo na gram) _____kgs _____gm

37. Je mtoto ananyonya au alinyonyeshwa kwa miaka 2 kabla ya kuachishwa? Ndiyo 1, Hapana 2 ( )

38. Hali ya lishe (angalia kadi ya kliniki) Hana utapia mlo 1, Ana utapia mlo 2.

39. Mtoto amewahi kuharisha (yaani kupata choo chepesi/cha maji maji na cha mara kwa mara isivyo kawaida.

- Katika kipindi cha wiki mbili zilizopita? Ndiyo 1, Hapana 2
( )

- Katika kipindi cha mwezi mmoja uliopita? Ndiyo 1, Hapana 2
( )

- Katika kipindi cha miezi miwili iliyopita? Ndiyo 1, Hapana 2
( )

- Katika kipindi cha miezi mitatu iliyopita? Ndiyo 1, Hapana 2
( )

40. Katika kipindi ambacho mtoto huyu aliharisha, alipata huduma yoyote? Itaje.

Nilimpeleka hospitali 1, Nilimpa ORS 2, Nilimtengenezea Maji ya chumvi na sukari 3, Huduma nyingine (taja)_____
( )

41. Kwa nyumba yenye <5 zaidi ya anaye uliziwa, Je ndugu zake waliharisha pia

Ndiyo 1, Hapana 2
( )

42. Nani alianza kuharisha

Anayeuliziwa 1, Mwingine 2
( )