



Science

KNOWLEDGE, PERCEPTIONS AND PRACTICES ON CHOLERA TRANSMISSION AND PREVENTION MEASURES AMONG HEADS OF HOUSEHOLD MEMBERS IN KIGAMBONI MUNICIPALITY, DAR ES SALAAM, TANZANIA

Ramadhani H. Nauja ^{*1,2}, **Fidelis Charles Bugoye** ², **Rongo L. M. B.** ³

^{*1} School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, Tanzania

^{*2} Department of Forensic Science and DNA Services, Government Chemist Laboratory Authority, Tanzania

³ Departments of Occupation and Environmental Health, Muhimbili University of Health and Allied Sciences, Tanzania

Abstract

Background: The Kigamboni Municipality has been experiencing recurrences of Cholera outbreaks. Objectives: The objective of this study was to evaluate knowledge, attitude and practices associated with Cholera transmission and prevention measures.

Method: A cross section descriptive study was adopted. A multistage sampling was used to select 410 respondents. An Interview schedule was used to obtain respondents opinions. Statistical Package for Social Sciences software version 20.0 was used to generate descriptive statistics which were further summarized into contingency tables.

Results: Results indicate that the most study population (70.2%) had knowledge on causes, symptoms and the modes of transmission of Cholera. It was also found out that communities treat drinking water to make it safe (76.8%) and are regular in hand washing with soap (80.9%). The result also indicates that the community is willing to vaccination (90%) and to adopting the Cholera prevention measures (92.7%).

Conclusions and recommendations: The supply of pure water and adequate sanitation may serve as the prevention measures against the Cholera outbreak recurrences at Kigamboni Municipality.

Keywords: Cholera; Knowledge; Perceptions; Practices; Prevention; Kigamboni Municipality.

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1. Introduction

Since the early 1800s, pandemics of cholera have affected millions (Harris et al., 2012). It is estimated that 1.3 to 4.0 million cases of cholera and 21 000 to 143 000 deaths occurs each year due to cholera worldwide (Ali et al., 2015). Cholera is one among the global public health and an indicator of underdevelopment (Adeneye et al., 2016). It is an acute enteric infection of the small intestines, caused by bacterium ingestion of *Vibrio cholera* and is transmitted through ingestion of contaminated food or water (Kadaleka, S., 2011). The signs and symptoms of cholera can vary from mild to severe such as severe watery diarrhea, vomiting and others, the promotion of improved hygiene practices and better access to safe water and sanitation facilities are the methods of preventing cholera due to being fecal-oral disease and rapid in its onset and spread (UNICEF., 2004). The control of cholera outbreak often requires changes to hygienic behavior (Phiri et al., 2015).

Cholera can be endemic or epidemic. A cholera endemic area is an area where confirmed cholera cases were detected during 3 out of the last 5 years with evidence of local transmission. A cholera outbreak or epidemic is an occurrence of at least 1 confirmed case of cholera with evidence of local transmission in an area where there is not usually cholera. (WHO., 2019). The risk factors associated with cholera outbreak includes little knowledge on the causes, modes of transmission, symptoms, prevention and control of the disease, attitudes towards the disease outbreak, low level of hygiene and environmental sanitation, poor hand washing behavior after visiting latrines, before and after eating food, during food preparation and during milking of the infants, poor tendency of using latrines, defecation behavior near sources of rivers, lack of treatment facilities and general treatment of drinking water such as water chlorination, low income and the socio economic status, use of street vended foods, bathing in the river, short distance to water sources and residents or the proximity to surface water, use of untreated water, low educational level, poor housing, unhygienic food handling, processing and preservation practices, poor sources of water for various domestic uses and improper and inadequate sewage disposal systems (Ali et al., 2015, Phiri et al., 2015, Kadaleka, S., 2011, Harris et al., 2012, Wahed et al., 2013, Lilje et al., 2015, Jerry et al., 2013, Makuza, N.J., 2002, Lindi, J.B., 2010 and Mpazi et al., 2005).

In Tanzania, the first 10 cholera cases were reported in 1974. Since 1977 then, an outbreak were reported each year with a case fatality rate (CFR) averaging 10.5% (between 1977 and 1992). The first major outbreak occurred in 1992 when 18'526 cases including 2173 deaths were recorded with a case fatality rate of (CFR= 11.7%). The outbreak of 1997 resulted in 40'249 cases and 2'231 deaths (CFR 5.54%) (WHO., 2008). In 2006 occurred a wide coverage outbreak and a total of 14 297 cases including 254 deaths (CFR= 1.8%) were reported from 16 regions out of 21 including Arusha, Dar es salaam, Dodoma, Iringa, Kigoma, Kilimanjaro, Lindi, Manyara, Mbeya, Morogoro, Mtwara, Pwani, Rukwa, Ruvuma, Tabora, Tanga. The most affected regions were Dar es Salaam (8965), Ruvuma (1 507) and Kigoma (1 030) while highest CFR were Mtwara (33.3%), Iringa (12.7%) and Dodoma (6.7%) had the highest case fatality rates. Dar es Salaam was highly affected with 8,965 cases representing 62.7% of the total cases and 101 deaths (39.8% of total deaths) (WHO., 2008).

The control and prevention of the disease outbreak has been linked to the access of safe water and improved sanitation. Tanzanian government with stakeholders tried to prevent and control an

outbreak by providing health education and training with regards to cholera causes, signs and symptoms, its transmission and modes of control and preventions of the disease as well as purchasing supplies and equipment. However, the outbreak have been recurring every year despite the efforts above hence necessitates further studies on the critical factors behind the recurrence of the outbreak. Therefore, the present study aims at underlying the reasons behind the epidemics focusing on behaviours of the population and individuals members in Kigamboni Municipal, Dar es Salaam, Tanzania.

Statement of the Problem

Cholera outbreak is still a public health problem in Tanzania. It has been in recurrence since 1977. Knowledge level, perceptions and hygiene practices contributes to the Cholera preventive measures that are implemented. Despite the vast body of knowledge on cholera, treatments and prevention measures, Cholera remains a challenge in Kigamboni municipality. The study conducted in Dar es Salaam revealed that the hygiene practices of the community members reflected a lack of knowledge and a negative attitude towards cholera with some misconceptions about the Cholera (Mpazi and Mnyika., 2005). As the levels of knowledge, perceptions and hygiene practices determine the preventive measures needed to combat the recurrence of Cholera; this study assessed the knowledge, perceptions and practices of the heads of households in the Kigamboni community regarding cholera transmission and prevention measures. The study seeks to contribute necessary information for developing effective and efficient policies, strategies and interventions that are easily implementable in the resource scarce areas like Kigamboni municipality in combating the Cholera outbreak.

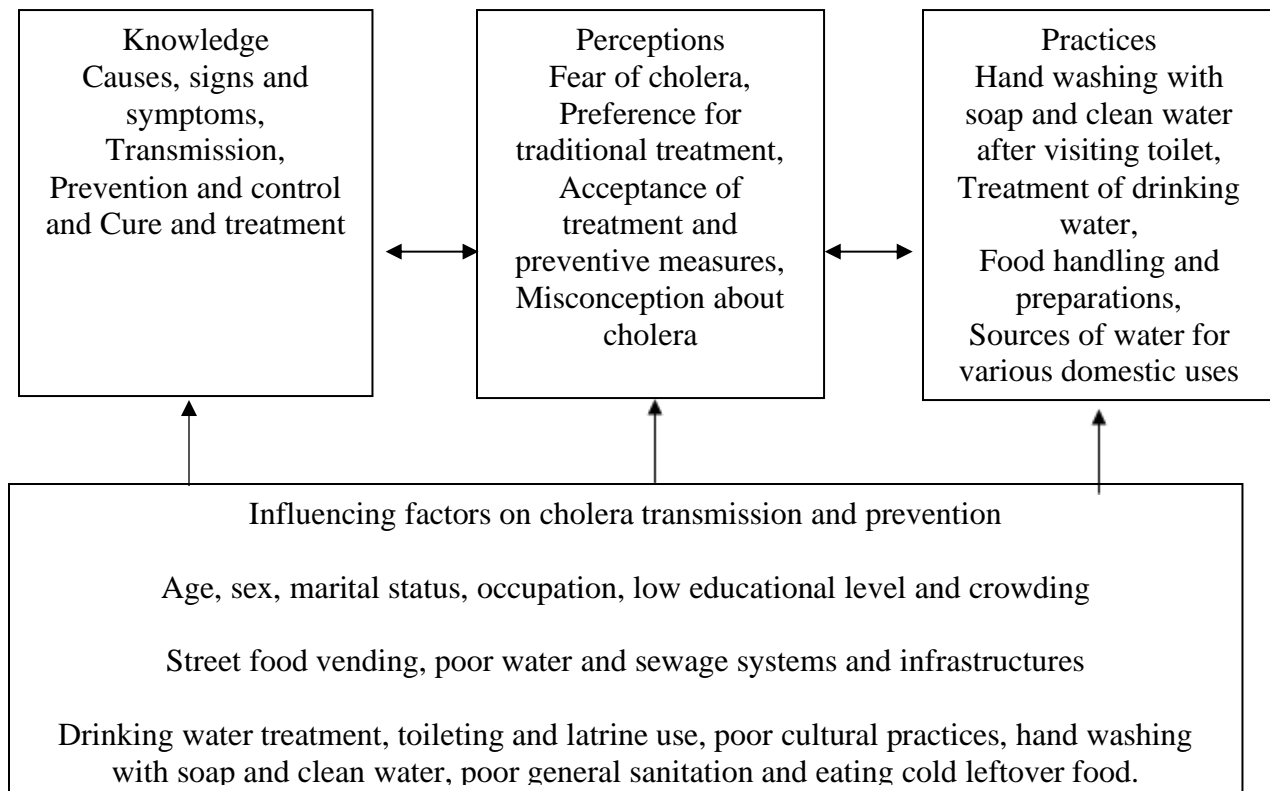


Figure 1: Descriptive diagram/Conceptual framework

Research Objectives and Rationale of the Study

The main objective of this study was to assess the Knowledge, Perceptions and Practices on Cholera transmission and prevention measures among heads of household members in Kigamboni Municipality.

The present research study provides the information towards Knowledge, Perceptions and Practices on Cholera transmission and prevention measures among heads of household members in Kigamboni Municipality. The information will be utilized by the policy makers and health management teams in developing efficient and effective policies, strategies and interventions against Cholera in Kigamboni Municipality.

2. Materials and Methods

Study Design and Population

A descriptive cross sectional study was conducted at Kigamboni Municipality. The study was carried out in Kigamboni Municipality in Dar es Salaam in which heads of households were involved. Kigamboni Municipal is characterized with total population of 205,966 according to Tanzania population census of 2012, among them 103,321 females and 102,645 males (Tanzania population census 2012), life expectancy is 62 years for males and 66 years for females (WHO., 2019).

Study Area

Kigamboni Municipal is an administrative municipality of the Dar es Salaam city in Tanzania. The Municipality originated from Temeke Municipal in 2015 under the government gazette announcement number 462 of 2015 then letter on it become a Municipal in year 2016 (kigambonimc.blogspot.com).

Kigamboni Municipal covers an area of 416 sq km. Administratively it has 9 wards which are Kibada, Kigamboni, Kimbiji, Kisarawe 2, Mjimwema, Pemba Mnazi, Somangila, Tungi and Vijibweni and 67 sub wards. In terms of health services there are 10 government and 5 private dispensaries providing the health services to the residents of the municipal. There are 83 deep wells as the sources of water for different uses, 26 are owned by the local community members and 57 by the government (kigambonimc.blogspot.com).

Kigamboni Municipal is located in the eastern part of Dar es Salaam city and shares its border with Indian Ocean on its northern and eastern parts while the south is bordered with Mkuranga district and on the west with Temeke municipal. There is one tarmac road from Kigamboni Ferry to Kimbiji and Mbagala (kigambonimc.blogspot.com).

Sample Size Selection and Determination

The heads of households' members were randomly selected from parts of Kigamboni Municipality. Sample size was estimated by using single proportion formula (Wayne, 1987) and the sample size for this study was adjusted to 410.

Sampling Procedure

A multistage sampling method was used to select the study participants. The sampling frame of all 9 wards in Kigamboni Municipal was randomly made and 3 wards were randomly selected. From the selected ward the sampling frame of all villages was randomly made and only 5 villages were randomly selected. From the selected 5 villages the sampling frame was randomly made to randomly select 10 hamlets with ten households each in 4 villages and 1 hamlet with ten households in 1 village was used for the study, from each household, the heads of the households were interviewed.

Variables

The dependent variables are Knowledge, perception and practice and independent variables are age, sex, marital status, poverty, unemployment, street food vending, poor water and sewage systems and infrastructures, Drinking water treatment, toileting and latrine use, poor cultural practices, hand washing with soap and clean water, poor general sanitation and eating cold leftover food. Generally the practice was measured as good practice or poor practice, the knowledge was assessed as good, moderate or poor depending on the respondent's responses and perception was measured as positive or negative both depending on the responses provided by the respondent in attempting the questions and the number of questions attempted and the correctness of the responses.

Data Collection Instruments and Pre Testing

The interview schedule was used to collect information. Principal researcher and the two research assistants trained on this study were involved in data collection. Data collection instruments were pre-tested in Mji Mwema ward in Kigamboni Municipality to check the clarity of the questions. The review of questions was made following the outcomes of the pre testing before embarking upon the data collection of the study.

Data Processing and Analysis

All filled interview schedules were checked daily for completeness after the interview. At the end of interviews, open-ended questions were coded for computer entry. Once data entry was completed, data was cleaned, validated and analyzed using the Statistical Packages for the Social Sciences (SPSS) version 20.0. Chi-squared statistics for contingency tables was used to assess the association between knowledge of cholera, perceptions, practices and influencing factors on cholera transmission and prevention. Statistical significance was assessed using P values and all results were considered significant if $P \leq 0.05$.

Ethical Issues

Ethics is a system of moral values that is concerned with the degree to which research procedures adhere to legal, professional and social obligations to the study participants (Polit and Beck, 2008).

Ethical approval for this research study was obtained from MUHAS Ethical Research Committee (Institutional Review Board) and the permission to conduct the study in Kigamboni Municipal was obtained from the Director of Kigamboni Municipal Council, Municipal Medical Officer and the Ward Executive Officers of Kigamboni, Tungi and Vijibweni wards.

3. Results and Discussions

Results

Socio Demographic Characteristics of The Respondents

The socio demographic characteristics of the respondents are presented in table 1. Of the 410 respondents interviewed, 141 (34.4%) were males while 269 (65.6%) were females. Among the respondents 155 (37.8%) had the age between 18-24 years old, 191 (46.6%) the age between 25-44 years old and 64 (15.6%) had the age of 45 years and above. The majority of the respondents were Muslim 240 (58.5%) followed by the Christians 170 (41.5%).

Most 184 (44.9%) of the respondents are living in low density area, while others 118 (28.8%) and 108 (26.3%) lives in medium and high density areas respectively. Among all the respondents 171 (41.7%) had primary education, 158 (38.5%) secondary education, 54 (13.2%) had university education, 21 (5.1%) had college education and few 6 (1.5%) had informal education. Most 194 (47.3%) of the houses of the respondents had more than four number of rooms, while others had one room 88 (21.5%), two rooms 48 (11.7 %) and three rooms 80 (19.5%) respectively.

Table 1: Social Demographic and personal information

Item	Frequency (n)	Percentage (%)
Sex		
Male	141	34.4
Female	269	65.6
Age		
18 - 24	155	37.8
25 - 44	191	46.6
45 and above	64	15.6
Marital status		
Single	203	49.5
Married	181	44.1
Widowed	10	2.4
Separated	17	4.1
Religion		
Muslim	240	58.5
Christian	170	41.5
Location of home		
High density	108	26.3
Medium density	118	28.8
Low density	184	44.9
Level of education		
No formal education	6	1.5
Primary	171	41.7
Secondary	158	38.5
College	21	5.1
University	54	13.2
Number of rooms in house		

One	88	21.5
Two	48	11.7
Three	80	19.5
Four and above	194	47.3
Occupation of head of the house		
Unemployed	101	24.6
Self-employed	257	62.7
Formal employment	52	12.7

Knowledge Regarding Cholera Transmission and Prevention

Table 2 presents the results on knowledge of cholera among the respondents interviewed in the study. Among 410 respondents, 288 (70.2%) have knowledge about cholera while 122 (29.8%) have poor knowledge about cholera.

Most 368 (89.8%) of the respondents identified germs as the causative agent of cholera while few 9 (2.2%) believe witchcraft as the causative agent for cholera and 33 (8%) they never understood the causative agent of cholera. Majority 384 (93.7%) of the respondents identified severe diarrhea and vomiting as signs and symptoms of cholera while 9 (2.2%) and 17 (4.1%) identified a normal diarrhoeal and vomiting as well as loss of weight as the symptoms of cholera respectively. Majority 203 (49.5%) of the respondents believe that cholera is transmitted through air while 185 (45.1%) believe that it is transmitted through contaminated food and water and few 22 (5.4%) believe cholera is transmitted through tears.

Majority of respondents 386 (94.1%) suggest the supply of pure water and adequate sanitation as the means of controlling cholera outbreak while the supply of traditional medicines had been suggested by 9 (2.2) and 15 (3.7%) they know nothing about cholera control ways. Provision of oral rehydration solution (ORS) as the treatment of cholera has been suggested by 284 (69.3%) respondents while others 116 (28.3%) they are not sure and few 10 (2.4%) suggest the provision of traditional medicine as the treatment of cholera.

Table 2: Knowledge on cholera transmission and prevention

Item	Frequency (n)	Percentage (%)
Heard about cholera		
Yes	389	94.9
No	21	5.1
Knowledgeable about cholera		
Yes	288	70.2
No	122	29.8
Heard about cholera through		
Relative and friends	176	42.9
Media	209	51
Never heard	25	6.1
Seen cholera patients		
Yes	193	47.1
No	217	52.9

Causes of cholera		
Germs	368	89.8
Witchcraft	9	2.2
I don't know	33	8
Symptoms of cholera		
Loss weight	17	4.1
Diarrhea and vomiting	9	2.2
One has severe diarrhea and vomiting	384	93.7
Mode of cholera transmission		
Through air	203	49.5
Through contaminated water and food	185	45.1
Through tears	22	5.4
Ways of preventing cholera		
I don't know	15	3.7
Supply of pure water and adequate sanitation	386	94.1
Take traditional medicine	9	2.2
Treatment of cholera		
Give traditional medicine and nurse at home	10	2.4
Give ORS and take to health center/ institution	284	69.3
I am not sure	116	28.3
Heard about cholera vaccine		
Yes	186	45.4
No	224	54.6

Knowledge of Cholera in Relation to Age Groups

The majority of respondents with high knowledge regarding cholera were found between the age groups of 25-44 (66.7%), 18-24 (69.2%) and 45 and above (83.9%). The difference is statistically significant ($P < 0.05$).

Table 3: Cross tabulation of knowledge about cholera among the age groups

Item		Knowledge About Cholera		Total
		Yes	No	
Age group	18-24	108 (69.2%)	48 (30.8%)	156 (100%)
	25-44	128 (66.7%)	64 (33.3%)	192 (100%)
	45 and above	52 (83.9%)	10 (16.1%)	62 (100%)
Total		288 (70.2%)	122 (29.8%)	410 (100%)

Perceptions on Cholera Transmission and Prevention Measures

Table 4, presents results on perception concerning cholera transmission and prevention measures among the respondents interviewed in the study. Most 229 (55.9%) of the respondents had negative perceptions on food sharing on gatherings during the outbreak of Cholera, 72 (17.6%) perceived very bad, 60 (14.6%) perceived bad, 27 (6.6%) were not sure and 22 (5.4%) didn't fill badly on food sharing.

Among the 410 respondents, 462 (88.3%) perceived positively that fruits should be washed before eating, 43 (10.5%) perceived that it should be washed while 5 (1.2%) out of the respondents they were not sure if it should be washed or not before eating. The results revealed that the majority of the community members 380 (92.7%) are interested in in preventing cholera while few showed lack of interest 30 (7.3%).

In this study it has been revealed that the most 369 (90%) residents of Kigamboni are willing to vaccinate themselves and their families while few 20 (4.9%) are not willing probably due to lack of knowledge on vaccination and 21 (5.1%) don't understand the same falls under the lack of knowledge.

Table 4: Perceptions on Cholera Transmission and Prevention

Item	Frequency (n)	Percentage (%)
Feelings about food sharing		
Strongly bad	229	55.9
Not very bad	72	17.6
Bad	60	14.6
Strongly okay	22	5.4
Not sure	27	6.6
Fruits washing before eating		
Strongly agree	362	88.3
Agree	43	10.5
Not sure	5	1.2
Reason behind the rise in street vending		
Increase in poverty levels	260	63.4
Encouragement from political leaders	38	9.3
Increase in population	81	19.8
I don't know	31	7.6
Interest in preventing cholera		
Yes	380	92.7
No	30	7.3
Willingness to vaccination		
Yes	369	90
No	20	4.9
Don't know	21	5.1
Willingness to vaccinate the family		
Yes	376	91.7
No	8	2
Don't know	12	2.9
Refused	14	3.4

Perceptions on Food Sharing in Relation to Age Group

Regarding the perception of food sharing in gatherings during cholera outbreak among the age groups, majority 87 (57.2%), 110 (57.6%) and 32 (47.8%) perceived strongly bad on gathering food sharing during cholera outbreak among 18-24, 25-44 and above 44 age groups. The difference

is statistically significant ($P < 0.007$). Table 5, presents a cross tabulation of perception concerning food sharing among the age groups.

Table 5: Cross tabulation of perception about food sharing among the age groups

Item		Feeling about food sharing on gatherings					Total
		Strongly bad	Not bad	bad	Okay	Not sure	
Age group	18-24	87 (57.2%)	20 (13.2%)	24 (15.8%)	9 (6.0%)	12 (7.9%)	152 (100%)
	25-44	110 (57.6%)	38 (19.9%)	23 (12%)	11 (5.8%)	9 (4.8%)	191 (100%)
	>44	32 (47.8%)	14 (20.9%)	13 (19.4%)	2 (3.0%)	6 (9.0%)	67 (100%)
Total		229 (55.9%)	72 (17.6%)	60 (14.6%)	22 (5.4%)	27 (6.6%)	410 (100%)

Practices regarding Cholera Transmission and Prevention

World health organization advocates that the long term solution for cholera control lies in economic development and universal access to safe drinking water and adequate sanitation. That is to ensure use of safe water, basic sanitation and good hygiene practices in cholera hotspots (WHO, 2019). Table 6, frequency table showing respondents practices regarding cholera transmission and prevention measures.

The results of this study revealed that the majority of the respondents 260 (63.5%) use piped water as their source of drinking water, 68 (16.6%) use water from venders and 60 (14.7%) use well water, however 13 (3.2%) among 60 (14.7%) use water from unprotected wells as their source of drinking water. The study findings showed that the most of the residents 315 (76.8%) treat while 74 (18%) do not treat water to make it safe for drinking. However among them few 139 (33.9%) of treat drinking water often

In this study it has been revealed that the majority of the community members 328 (80%) are regular in hand washing while few 64 (15.6%) wash occasionally. Among the respondents 384 (93.7%) wash their hands after visiting toilets while 26 (6.3%) don't wash. Again it is revealed that most 363 (88.5%) of the respondents possess soap and detergents at their homes for washing hands and other domestic use. Most 305 (74.4%) of the majority will rush the cholera patient to the nearest treatment center while 73 (7.8%) will give ORS (Oral Rehydration Solution) to a person developed cholera.

Table 6: Practices on Cholera Transmission and Prevention

Item	Frequency (n)	Percentage (%)
Source of drinking water		
Piped water, in house	170	41.5
Piped water, in court	49	12
Piped water, public	41	10
Communal standpipe	22	5.4
Well, protected	13	3.2
Well, unprotected	13	3.2
Well with pump	34	8.3
Water truck /water vendor	68	16.6
Water treatment to make it safe to drink		

Yes	315	76.8
No	74	18
Don't know	21	5.1
How often water treatment is done		
All the time	139	33.9
Most of the time	92	22.4
Sometimes	94	22.9
Did not treat water during past 6 months	85	20.7
Regularity in hand washing		
Yes	328	80
Occasionally	64	15.6
No	18	4.4
Washing hands after using toilet		
Yes	384	93.7
No	26	6.3
Presence of soap or detergent in the house		
Yes	363	88.5
No	25	6.1
Don't know	22	5.4
Refuse disposal		
Dust bin/ bags	250	61
Dugout rubbish pit	144	35.1
Open space	8	2
Other specify	8	2
Getting rid of the disposed refuse completely		
By burning	191	46.6
By burring	42	10.2
Through the local authority	160	39
Other means	17	4.1
Practice on fruits before eating		
Wash before eating	366	89.3
Pearl before eating	25	6.1
Sometimes wash and sometimes not	10	2.4
I don't do anything	9	2.2
Keeping the leftover food		
Cover the food	303	73.9
Refrigerate	107	26.1
Practice on leftover food before eating		
Heat before eating	378	92.2
Eaten cold	16	3.9
Thrown away	16	3.9

Practice when a member of the household develops cholera		
Give traditional herbs and observe at home	20	4.9
Give Oral Rehydration Salt	73	7.8
Rush the individual to the health facility	305	74.4
Nothing	12	2.9
Drinking water boiling to make it safe		
Yes	343	83.7
No	67	16.3

Practices on Boiling Drinking Water Among the Age Groups

Among the respondents age groups majority 140 (91.5%), 145 (78.8%) and 50 (76.9%) of them boil their drinking water to make it safe among the age groups 18-24, 25-44 and 45 years and above respectively. The difference is statistically significant ($P < 0.05$).

Table 7: Cross tabulation of boiling tendency to make water safe among the age groups

Item		Boiling water to make safe		Total
		Yes	No	
Age group	18-24	140 (91.5%)	13 (8.5%)	153 (100%)
	25-44	145 (78.8%)	39 (21.2%)	184 (100%)
	>45	50 (76.9%)	15 (23.1%)	65 (100%)
Total		343 (83.7%)	67 (16.3%)	410 (100%)

4. Discussions

Knowledge on Cholera Transmission and Prevention Measures

This study aimed at assessing the knowledge, perceptions and practices regarding Cholera transmission and prevention. Results showed that among 410 respondents, 70.2% had knowledge about Cholera; respondents identified germs as the causative agent of cholera, severe diarrhea and vomiting as signs and symptoms of cholera and identified that Cholera is transmitted through contaminated food and water. Similar study where conducted in Dar es Salaam, Tanzania where by 85% of the respondents possessed knowledge of cholera (*Mpazi et al., 2005*). However, this study also revealed a negative belief on the mode of transmission of cholera, that it is transmitted through air and tears. Studies conducted in Dar es Salaam and Haiti reported negative belief among the community members studied (*Mpazi et al., 2005* and *Valery et al., 2011*).

Respondents in this study revealed that the supply of pure water and adequate sanitation is a key prevention measures in controlling cholera outbreak in Kigamboni. WHO report of 2019 recommends the supply of pure water and adequate sanitation as standard control and prevention measures against Cholera (WHO., 2019). However similar study were conducted in Nigeria and revealed that the provision of safe and clean water as well as good environmental hygiene as control and prevention measures against Cholera outbreak (*Adeneye et al., 2016*).

According to WHO, Vaccine – Preventable Disease Surveillance Standards of 2019 recommends that treatment of Cholera should depends on severity of illness and level of dehydration and that severe cases need intravenous rehydration and antibiotics, Milder cases can be treated with an

Oral Rehydration Solution and zinc supplementation should also be given to children < 5 years of age (WHO., 2019). In this study the respondents suggested the provision of Oral Rehydration Solution (ORS) as the treatment of Cholera which concurs to the recommendations of World Health Organization (WHO). Similar understanding and knowledge about Oral Rehydration Solution (ORS) were revealed in studies conducted in Notre dame, Dhaka Bangladesh and Nigeria (*Guzman J. C., 2013, Tasnuva et al., 2013 and Valery et al., 2010*).

Perceptions on Cholera Transmission and Prevention Measures

This study found out that the respondents had positive perceptions about food sharing on gatherings during the Cholera Outbreak this indicated a positive perception about Cholera, also respondents perceived that fruits should be washed before eating which is one among the methods of preventing Cholera transmission. The studies conducted in Bangladesh revealed that the majority of the respondents had positive perception about Cholera with regards to food sharing and fruits washing (*Tasnuva et al., 2013*). Again, in this study it has been found out that there is a relationship between perceptions of food sharing in gatherings during cholera outbreak and the age groups. The difference is statistically significant ($P < 0.007$).

The present study suggest that the majority of the respondents are interested in preventing Cholera and are willing to vaccinate themselves and their families in prevention of Cholera. These findings are vital in planning for the vaccination program and campaign in the area in an effort to prevent Cholera Outbreaks. These findings concurs to the findings of the study conducted in Haiti, where many people were found to be willing to vaccination (*Louise et al., 2016*).

Practices on Cholera Transmission and Prevention Measures

The outbreak of Cholera could be attributed to transmission through faecally contaminated water (*Adeneye et al., 2016*). This study revealed that the majority of the respondents use piped water and well water as their source of drinking water; however, water treatment, treatments of wells and covering of the wells had been a challenge to the respondent's interviewed. This may lead to the drinking of *Vibrio Cholerae* contaminated water and finally leads to the transmission of the Cholera. The studies conducted in Hait, Dar es Salaam and Notre dame its respondents mentioned piped water and well water as the sources of drinking water however the challenges were on the treatments of the water sources and water itself (*Adeneye et al., 2016, Mpazi et al., 2005 and Guzman J. C., 2013*).

The findings of this study revealed that the respondents treat water to make it safe for drinking through boiling and Chlorination or bleach solution. Water treatment is one of the methods used in prevention and control of Cholera. Several studies have reported the use of choline or bleach solution, water treatment tablets and boiling as the methods of water treatments to make drinking water safe for drinking and hence preventing Cholera Outbreaks and its transmissions (*Mpazi et al., 2005, Lana et al., 2016, Adeneye et al., 2016, Guzman J. C., 2013, Megan et al., 2001 and Valery et al., 2011*).

WHO recommends that preventive efforts should include promotion of hand-washing and safe food handling practices (WHO., 2019). The waste disposals and hand wash practices are essential practices in fighting against cholera; however, pits should be treated to avoid multiplication of cholera germs (*Zohura et al., 2016*). In this study the results revealed that the majority of the

respondents were regular in hand washing with soap and clean water, wash their hands after visiting toilets, poses soap and detergents at their homes for washing hands and wash fruits before eating, however there were slackness in its implementation.

These findings revealed that the practices needs to be improved towards prevention of Cholera Outbreaks and similar findings on practices has been reported by studies done in Dar es Salaam, Notre dame, Madagascar and Haiti (*Mpazi et al., 2005, Guzman J. C., 2013, Megan et al., 2001 and Valery et al., 2011*).

The study conducted in Madagascar revealed that consumption of the cold leftover food had significance in Cholera transmission (*Megan et al., 2001*). In this study it has been found out that the majority of the respondents covers and refrigerate the leftover food and most of the respondents heat the leftover food before eating in an effort of preventing Cholera Transmission.

Practices when a family member develops a Cholera has been revealed in this study that majority of respondents will give ORS (Oral Rehydration Solution) and rush the cholera patient to the nearest Cholera Treatment Center (CTC). Study conducted in Nigeria, Haiti and Dar es Salaam, recommended on the provision of a documented guidance to the Cholera Treatment Centers and the supply of Oral Rehydration Salt (ORS) packets so as to improve Cholera patient management and treatment. (*Adeneye et al., 2016, Lana et al., 2016 and McCrickard et al., 2017*).

Among the respondents age groups majority 91.5%, 78.8% and 76.9% of them boil their drinking water to make it safe among the age groups 18-24, 25-44 and 45 years and above respectively. The difference is statistically significant ($P < 0.05$).

5. Conclusions and Recommendations

Conclusion

The study was carried out to seek the Knowledge, Attitude and Practice on Cholera transmission and prevention measures at Kigamboni Municipal. The study revealed that the majority of the respondents had good knowledge on cholera; the majority had average Practices and positive Perceptions towards the transmission and prevention of cholera. The study has revealed that 70.2% of the respondents had knowledge on cholera regarding its causes, symptoms and signs, transmission, treatments and its prevention measures. It was also found out that the respondents had positive perceptions in Cholera transmissions and prevention measures as most 92.7% were interested in Cholera prevention and willing to vaccination.

Furthermore the results indicated that the respondents had an average practices with regards to Cholera transmission and prevention measures as 63.5% use the pipe water as their source of drinking water and among them only 76.8% treat water to make it safe for drinking and 80% are regular in washing their hands with soap after and before food, visiting toilets and preparations of foods.

Recommendations

The study had revealed that majority of the respondents agreed on the supply of Oral Rehydration Solution (ORS) sachets, pure water, adequate sanitations and vaccination as the control and prevention measures against Cholera Outbreak in Kigamboni Municipality.

The following are the recommendations made based on the findings of this study, awareness creations among the residents of Kigamboni Municipality regarding practices which facilitate the spread of Cholera, removal of misconception with regards to the causes of Cholera and its modes of transmissions, well water used as the sources of drinking water should be treated regularly and protected all the time and the supply of Oral Rehydration Solution (ORS) sachets, pure water, vaccination, adequate and proper sanitations to the Kigamboni Municipality by the Government. However, future studies should be planned to investigate on the effectiveness and efficiency of knowledge, health policies and health related in addressing the Cholera Outbreak Challenge.

Acknowledgements

First and foremost, all thanks to God for the whole thing that I am and will be. Without God, I am nothing. The Blessings are evident regardless of the challenges that were encountered; it reminds me that in trusting almighty God, everything is possible.

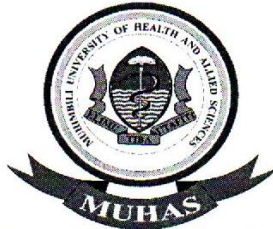
I would like to convey my special thanks to the Centre for Diseases Control (CDC), School of Public Health and Social Science (SPHSS) of Muhimbili university of Health and allied science for the financial support and time which facilitated the successful completion of this study.

I appreciate the Kigamboni Municipal for the support and permission to undertake this study and special appreciation also goes to all the research participants for accepting to participate in this study. I wish to acknowledge health representatives of Kigamboni, Kisiwani and Tungi wards for agreeing to participate and for their valuable time spent in the study especially during data collections. I am indebted to my research assistant Mr. Rajabu Mkieta and Ponsian Peter Kunambi for their support in data collection and analysis.

Appendices

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz



Tel G/Line: +255-22-2150302/6 Ext. 10
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpgs@muhas.ac.tz

Ref. No. DA.287/298/01A/

15th August, 2018

Mr. Ramadhani H. Nauja
MPH-Distance Learning
MUHAS.

**RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED:
"KNOWLEDGE, PERCEPTIONS AND PRACTICES ON CHOLERA
TRANSMISSION AND PREVENTION AMONG HEADS OF HOUSEHOLD
MEMBERS AGED 18 YEARS AND ABOVE IN KIGOMBONI MUNICIPALITY,
DAR ES SALAAM, TANZANIA"**

Reference is made to the above heading.

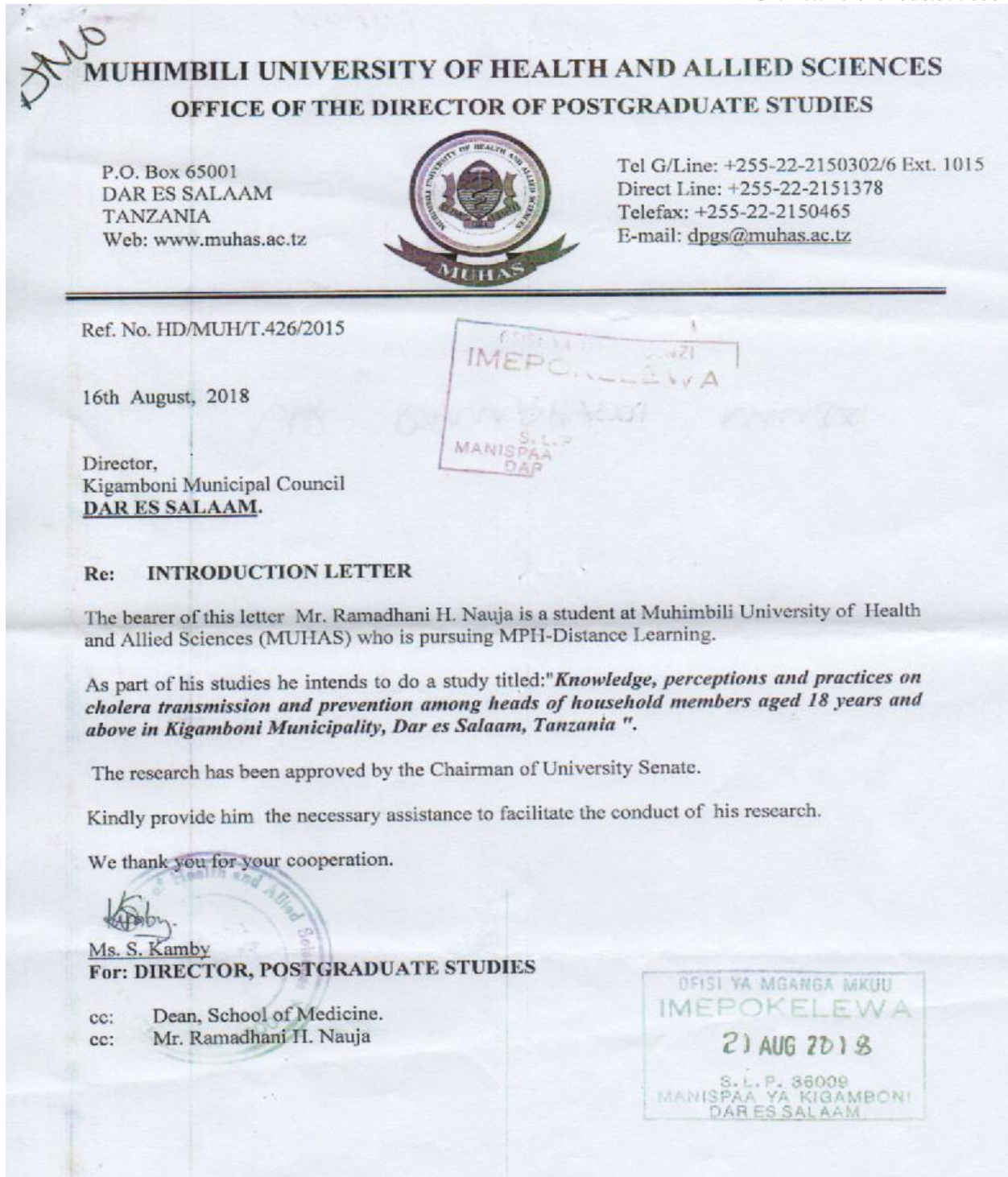
I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 14th August, 2018 to 13th August 2019. In case you do not complete data analysis and dissertation report writing by 13th August, 2019, you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences

Appendix 1: Approval of Ethical Clearance



Appendix 2: MUHAS Introduction Letter to Kigamboni Municipal

KIGAMBONI MUNICIPAL COUNCIL

[All letters should addressed to Municipal Director of Kigamboni]

Tell: +255 22-2928468
Fax: +255 22-2928469
E-mail: info@kigamboni.go.tz
Tovuti: www.kigamboni.go.tz



P.O.Box 36009,
KIGAMBONI,
DAR ES SALAAM,
TANZANIA.

Ref. No. KMUCH/Vol.3

Date: 21/08/2018

To: WFO's
KIGAMBONI, THUGI, VIIIBWENI
P.O. Box 36009,
DAR ES SALAAM

Dear Sir/Madam

REF: PERMISSION TO CONDUCT HEALTH RESEARCH ACTIVITIES IN KIGAMBONI MUNICIPALITY

Please refer to the above heading.

Extension of permission has been granted to Mr/Mrs/Miss/Prof/Dr. KALADHANI H. NAJIA from (institution) LIUHAS address For Tel No. to collect data for research.

The research title is Knowledge, perceptions and practices on cholera transmission and prevention among head of household members aged 18 years and above in Kigamboni Municipality

She/he has submitted the proposal for the mentioned study to the MMOH Office as a pre - condition prior to authorization.

The researchers have been instructed and agreed to submit the research progress reports and final results to the MMOH prior to any publications Data collection will restart on 23/08/2018 to 4/9/18.. sample size

This research work is part of Academic for fulfillment for Diploma/Advanced Diploma/Degree/Master/PHD it is part on going research in your Institution.

Your sincerely,

Emmanuel M. Fivawo
FOR MUNICIPAL MEDICAL OFFICER OF HEALTH KIGAMBONI

**FOR. DISTRICT MEDICAL OFFICER
KIGAMBONI MUNICIPAL COUNCIL**

Appendix 3: Kigamboni Municipal permission to conduct Health Research

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*Corresponding author.

E-mail address: mauja@ gmail.com