

Influence of Knowledge on the Management of Typhoid Fever in Bungoma County in Kenya

Elizabeth Khanyelele Makhanu

Prof. Kennedy Onkware

Dr. Edmund Were

Center for Disaster Management & Humanitarian Assistance

Masinde Muliro University of Science & Technology, Kenya

Email: elizabethmakhanu@hotmail.com;kenonkware@gmail.com;wearywere@gmail.com

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Abstract

Following the International conference on primary health care in 1978 by the World Health Assembly, one of the objectives was to achieve Health for all by the year 2000. A follow up on this shows that this objective was not achieved. There have been efforts by various stakeholders involved in health such as the Ministry of Health, WHO among others, to ensure that Health for All is achieved. But despite the efforts to improve health and improving health systems, typhoid fever still remains the leading cause of morbidity in Bungoma County in Kenya. This study therefore sought to examine the influence of knowledge on the management of typhoid fever in Bungoma County in Kenya. The conceptual framework was based on the basic principles of disease control. Descriptive survey research design was used in the study. The target population was 876,491 men, women and the children, 42 health staff from 42 health facilities and 16 village elders from the 8 divisions in the County. Multi-stage, stratified, snowball, purposive and simple random sampling techniques were used to select the study samples. Data collection instruments used included interview schedules, observations, and focus group discussions. Data was analysed using both the qualitative and quantitative techniques. The study found out that knowledge on disease cause has major influence on the management of typhoid fever as when people understand the etiology of the disease, then it is easy to prevent and control it. The study concluded that therefore, health education and knowledge on typhoid fever needs to be provided to the community through public health education to assist in the management of typhoid fever. The study recommended that the health sector should work with other sectors in the management of typhoid fever since the determinants of health and hence typhoid lie outside the health sector.

Keywords: Health, Knowledge, Management, Typhoid fever

Introduction

Management of typhoid fever continues to be a challenge even more than a century after the micro-organism was first isolated in 1884. This is because of the non-availability of a reliable rapid diagnostic test. The diagnostic skills of the treating physician were important in the past and even now especially in the undeveloped areas. There is also the issue of multi-drug resistance (MDR) strains among salmonellae which is a rising concern. The changing pattern of MDR in typhoid fever was studied in New Delhi in 1993 and the results showed that there is a changing pattern in the management of drug resistant typhoid fever but at the same time indicates that ciprofloxacin is not the drug of choice in all cases of typhoid fever and resistance to it may be seen in some cases where other drugs have to be used. This therefore means that a concerted effort involving clean water supplies, proper sanitary disposal, effective vaccination and early diagnosis and prompt treatment of cases and carriers are required in its management and control.

Control of communicable diseases depends upon recognition of the many ways transmission takes place. Education of the population in rules of public health is of great importance both in the matter of personal responsibility which includes the disposal of secretions, preventing contact with the blood of others, proper handling and preparation of food and personal hygiene and community responsibility such as safe water and food supply, sterile blood supply, garbage and waste disposal. Animal and insect carriers must be controlled, and the activities of human carriers must be limited. AMREF (2001), reports that communicable diseases are a leading cause of outpatient attendances, admissions and deaths and are widely distributed throughout Africa. They are caused by living organisms and spread from one living animal to another. The local frequency, distribution and importance of the individual communicable diseases vary from District to District and hence the need to know the pattern of the communicable diseases in each area. AMREF further notes that the communicable diseases of Africa often have people as main host and man as the main reservoir and as such, the diseases can be prevented and brought under control.

According to Sindiga (1995), respiratory infections and waterborne diseases are a leading cause of morbidity and mortality. He further points out that the poor sanitation, waste disposal and lack of clean water supplies are the main causes of waterborne diseases like typhoid, cholera and dysentery. On the other hand, typhoid has been classified by WHO as a disease with worldwide distribution and it is a long lasting fever spread by faecal contamination on food and by contaminated water. According to Jesudason and Kumar, (2006) typhoid fever is a global health problem. Its real impact is difficult to estimate because the clinical picture is usually confused with other febrile infections. Further, the disease is underestimated due to lack of bacteriology laboratories in most clinical settings of developing countries, although obviously the disease has a very high socio-economic impact.

STATEMENT OF THE PROBLEM

Typhoid fever is still rampant in Bungoma County (Provincial medical office, 2006). According to the 2006 records from the Western province medical office, almost half of the typhoid fever patients in 2006 were from Bungoma County, despite the various efforts to bring down the fever. Studies by Crump (2003) and Kariuki (2008) on the management of typhoid fever indicate that the diseases control and treatment have been hampered by antibiotic resistance and its changing patterns, recurrent *salmonellosis* in HIV positive patients, unreliable diagnostic tools, chronic carriers, the extent of the surgery on patients and unreliable vaccines. Savula (2005) indicates that typhoid fever is an endemic disease in Bungoma District.

For instance in 2005, typhoid was said to have struck the District with a vengeance where 13 people died and 108 were hospitalized just in two weeks. This was said to have been due to a contaminated government water supply.

Despite the improving health care system, typhoid fever still remains one of the leading causes of morbidity in Bungoma County as indicated by one study carried out in the Kabula area of Bungoma District by Nasike Community Development and Education Center (NACODE). They carried out an Anti-typhoid awareness campaign to make people be aware of the various aspects related to typhoid fever in Kenya. The results envisaged a poor scenario as far as typhoid is concerned. They found out that typhoid is more rampant in the rural western part of Kenya, despite the fact that people became aware of the various aspects of typhoid.

Given that Kenya is saddled with the economic burden of disease, it is important that the disease be managed economically. Despite the fact that people are aware of the causes of typhoid fever and how it can be treated, it continues to be a public health problem in many developing countries in sub-Saharan Africa. Determinants of typhoid fever lie outside the health sector yet much of the efforts in the management of typhoid fever has been emphasizing on the health sector in isolation.

OBJECTIVES OF THE STUDY

The specific objectives of the study were to;

- i. Establish the level of knowledge on the management of typhoid fever in Bungoma County.
- ii. Find out how the level of knowledge on typhoid fever influences the management of typhoid fever in Bungoma County.
- iii. Assess the extent to which typhoid fever knowledge affects the management of typhoid fever in Bungoma County.

1.4 RESEARCH QUESTIONS

The study was guided by the following research questions;

- iv. What is the level of knowledge on the management of typhoid fever in Bungoma County?
- v. How does the level of knowledge on typhoid fever influence the management of typhoid fever in Bungoma County?
- vi. To what extent does typhoid fever knowledge affect the management of typhoid fever in Bungoma County?

METHODOLOGY

Descriptive survey research design was used in the study which was carried out in Bungoma County of the Western region in Kenya. The target population was 876,491 men, women and the children, 42 health staff from 42 health facilities and 16 village elders from the 8 divisions in the County. Multi-stage, stratified, snowball, purposive and simple random sampling techniques were used to select the study samples. Data collection instruments used included interview schedules, observations, and focus group discussions. Data was analysed using both the qualitative and quantitative techniques.

FINDINGS

Table 1 Socio demographic background of the respondents

Characteristics	Category	Frequencies	Percentage
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Sex	Males	33	15
	Female	187	85
	Totals (n)	220	100
Age (Years)	Below 20	38	17
	20-40	123	56
	Above 40	59	27
	Totals (n)	220	100
Marital Status	Single	38	17
	Married	123	56
	Divorce	24	11
	Widow	35	16
	Totals (n)	220	100
Religion	Catholic	126	57
	Muslims	28	13
	Protestants	55	25
	Traditional religion	11	5
	Others	0	0
	Totals (n)	220	100
Highest level of Education attained	None	12	6
	Primary school level	82	37
	Secondary school level	84	38
	Tertiary	42	19
	Totals (n)	220	100
Employment status	None	160	72
	Self-employed	34	16
	Formal employment	26	12
	Totals (n)	220	100

Table 1 above reveals that 33 (15%) of the questionnaire respondents were male, while 187 (85%) were female. The data were collected at the household level, hence, the high number of females than males at home. The males were often away from home to work yet they are the final decision makers in the home determining the use of resources. Using soap to wash hands after visiting the toilet was termed as 'wasting soap,' hence, less emphasis on washing hands after visiting the toilet.

The age of the respondents ranged from 15 years to over 40 years with 38 (17%) in the age category below 20 years, 123 (56%) in the age category of 20-40 years, and 59 (27%) in the age category of above 40 years. Most of the respondents were aged between the ages 20-40 years and these are the people who mostly take care of the families. There is need for them to understand the causes, control and prevention of typhoid fever so as to help in the management of typhoid fever at the household level hence reduction in the burden of the fever.

The marital status of the questionnaire respondents was revealed as follows: 38 (17%) were single, 123 (56%) were married, 24 (11%) were divorced and 35 (16%) were widowed. A high percentage of the respondents were married. Since typhoid fever is communicable from one person to another, then this means that if one family member suffers from typhoid fever, then it can easily pass on from one household member to another given the fact that most of the respondents are not aware that the fever is not communicable from one person to another, hence a challenge to the management of typhoid fever at the household level..

Regarding the respondents' religious affiliation, the table two above shows that, 181 (82%) of the respondents were Christians (57% were Catholics and 25% were protestants), 28 (13%) were Moslems, 11 (5%) were of Traditional African Religion (*"Dini ya Msambwa"*). All the respondents belonged to a religion. This therefore indicates that religion can play an important role in the management of typhoid fever if knowledge on the management of the fever is passed on through the various religions that people in the community belong to.

Of the 120 questionnaire respondents, 42 (19%) had up to tertiary level education, 84 (38%) had attained up to secondary school level education, 82 (37%) had attained up to primary school level education while 12 (6%) had not attained any formal education. The level of education plays a significant role in the passing of information and gaining of knowledge of a given subject. Despite the fact that respondents had attained some level of education, they lacked adequate knowledge on the causes, the control and prevention of typhoid fever as they had not had a chance of being exposed to any form of public health education about typhoid fever.

Table 2 Knowledge on typhoid fever

Knowledge of typhoid	Frequency	Percentage
No	0	0
Yes	220	100
Total	220	100

From the socio-demographic data given above, out of the 220 respondents, only 5% of them had not attained any level of education while 95% had attained some level of education hence the high level of knowledge on typhoid fever. Table 2 above shows that all the respondents had knowledge about the typhoid fever, though it was found out that the knowledge they had was just misconceptions. The misconceptions that the respondents had on typhoid fever, was mainly due to the low levels of education attained by most of the respondents. This is because when asked if they had heard about typhoid fever, each one of them gave varied answers. For instance the findings showed that when asked on the causes of typhoid fever, the answers given were that typhoid fever was caused by a mosquito bite, or when rained on, or when one chews sugarcane. Awareness about the typhoid fever was not dependent on sex, education level, age, marital status, and or religion. The typhoid awareness can hence be said to be universal among the respondents.

Since most of the respondents acknowledged to have some level of knowledge on typhoid fever, it was also important to find out the level of knowledge and confirm the misconceptions they had. They were therefore asked if they knew of the symptoms of typhoid fever, its prevention methods, category of people affected by the fever and knowledge on prevention and control of the typhoid fever. This is shown in tables four, five, six, seven, eight, nine and ten.

Table 3 Knowledge on typhoid fever symptoms

Symptom	Category	Frequencies	Percentage
Diarrhoea	Yes	194	88
	No	26	12
	Totals (n)	220	100
Vomiting	Yes	194	88
	No	26	12
	Totals (n)	220	100
High Fever	Yes	178	81
	No	42	19
	Totals (n)	220	100
Loss of Appetite	Yes	207	15
	No	13	85
	Totals (n)	220	100
Headache	Yes	220	100
	No	0	0
	Totals (n)	220	100

From table 3 above, 194 (88%) of the respondents thought that diarrhoea is a symptom of typhoid fever while 26 (12%) of the respondents believed that diarrhoea is not one of the symptoms of typhoid fever. Diarrhoea has not been listed as one of the symptoms for the typhoid fever, yet this was the belief of most of the respondents. In fact when one suffers from typhoid fever then one of the symptoms is constipation which is the opposite symptom of diarrhoea.

Table 3 above also indicates that 194 (88%) of the respondents believed that vomiting was one of the symptoms associated with the typhoid fever while 26 (12%) of the respondents said that the fever is not associated with any form of vomiting. Nausea is one of the symptoms of typhoid fever hence a number of people are aware of this as one of the typhoid fever symptoms.

A patient suffering from typhoid fever will have high fever as one of the symptoms 178 (81%) of the respondents' associate high fever with the typhoid fever while 42 (19%) thought that

patients suffering from typhoid fever do not have high fever. A number of respondents hence do have knowledge about the typhoid fever symptoms.

On loss of appetite as a symptom of typhoid fever, 207 (94%) of the respondents know that loss of appetite is one of the symptoms of the typhoid fever while only 13 (6%) of the respondents do not associate loss of appetite with typhoid fever. Loss of appetite is one of the symptoms of typhoid fever. All the respondents know that headache is one of the typhoid fever symptoms and indeed headache is one of the symptoms of the typhoid fever.

Table 4 Prevention of typhoid fever

Prevention of typhoid fever		Frequency	Percentage
Valid	Yes	220	100%
	No	0	0%
Total		220	100%

From table 4 above all the respondents do actually believe that there must be certain preventive measures and steps that can be undertaken by one so as to be able to protect oneself from the disease. However, they are faced with a number of challenges such as lack of the resources and facilities.

Table 5 Knowledge on typhoid fever prevention methods

Characteristics	Category	Frequencies	Percentage
Mosquito Net	Yes	220	100
	No	0	0
	Totals (n)	220	100
Washing Hands	Yes	102	46
	No	118	54
	Totals (n)	220	100
Clean Environment	Yes	54	26
	No	156	74
	Totals (n)	220	100
Avoid Stagnant water	Yes	175	80
	No	45	20
	Totals (n)	220	100
Feaces disposal	Yes	15	7
	No	205	93
	Totals (n)	220	100
Boiling water	Yes	97	44
	No	123	56
	Totals (n)	220	100

All the 220 (100%) respondents believed that typhoid fever can be prevented when one covers oneself with a mosquito net as per the table 6 above. This is a misconception and hence the disease is more often confused with Malaria.

Table 5 shows that 102 (46%) of the respondents thought that if they practiced frequent washing of their hands with soap after visiting the toilet then they would be able to prevent themselves from being infected with the typhoid fever while 118 (54%) of the respondents believed that washing their hands with soap after visiting the toilet cannot prevent them from being infected with the typhoid fever. This is a problem especially in the rural areas where people rarely practice hand washing after a visit to the toilet because of ignorance and poverty. 19% (42) of the respondents did not have access to water storage containers and rely on a nearby water source for their daily use.

On keeping the environment clean to prevent the infection of typhoid fever, 166 (74%) of the respondents did not agree that by keeping their environment clean, they would be able to prevent themselves from being infected with the typhoid fever. This was also due to the fact that they believed that typhoid fever was caused by mosquito bites. 54 (26%) of the respondents agreed that a clean environment would lead to reduced infections of the typhoid fever though they said it was a challenge to ensure a clean environment as this was a collective responsibility. This shows that if individuals are educated on the importance of living in a clean environment, then it will be possible to manage the typhoid fever.

On stagnant water in the homes, 175 (80%) of the respondents agreed that if they avoided stagnant water around their homes then typhoid fever infections would be prevented while 45 (20%) of the respondents believe that stagnant water around the homes cannot prevent infection of the typhoid fever, but malaria. The respondents had gained the knowledge on malaria and not typhoid fever. This again is being confused with malaria as stagnant water though a menace around the homes mostly breeds mosquitoes which cause malaria. Though a certain percentage of typhoid fever infections may result from the stagnant waters around their homes, it is not the main causing agent.

Table 5 shows that 205 (93%) of the respondents believe that the children's faeces are not harmful hence do not believe that they can cause typhoid fever infections, even if they are not thrown in the latrines, while only 15 (7)% of the respondents say that typhoid fever infections can be caused by disposing the children's faeces carelessly. Most of the respondents were female who sometimes have regular contact with their children's faeces as they clean them.

Table 6 indicates that 123 (56%) of the respondents believe that boiling water cannot prevent the infection of typhoid water as they have been taking the same water for many years yet they have not been suffering from the typhoid fever every day. Only 97 (44%) of the respondents believe that boiling water can assist in preventing the infections of the typhoid fever.

Table 6 Knowledge on category of people affected by typhoid fever prevention

Characteristics	Category	Frequencies	Percentage
Children	Yes	220	100
	No	0	0
	Totals (n)	220	100

Teenagers	Yes	185	84
	No	35	16
	Totals (n)	220	100
Men	Yes	31	14
	No	189	86
	Totals (n)	220	100
Women	Yes	86	39
	No	134	61
	Totals (n)	220	100

Old People	Yes	211	96
	No	9	4
	Totals (n)	220	100

Table 6 reveals that all the 220 respondents agreed that children can suffer from the typhoid fever. The table also indicates that 185 (84%) of the respondents think that the teenagers cannot be infected with the typhoid fever while 35 (16%) of the respondents believe that even the teenagers can be infected with the typhoid fever. The reason given on why most of the teenagers cannot be infected with fever was that they are in a position to access resources and hence take care of themselves well than the children or the older people.

From table 6, 31(14%) of the respondents agreed that men can be infected with the typhoid fever while 189 (86%) of the respondents believe that men cannot be infected with the typhoid fever as they are supposed to be strong.

On women being infected with typhoid fever, 39% (86) of the respondents as indicated in the table above believed that women can be infected with the typhoid fever while 61% (134) of the respondents believe that women cannot be infected with the typhoid fever. It is important that the women are educated that they can be infected with the typhoid fever which they can easily pass over to other family members because they are the main people in the household that do handle food hence need to observe high levels of personal hygiene.

For older people, table 6 indicates that 211 (96%) of the respondents believed that the old people can also be infected with the typhoid fever while 9(4%) of the respondents agree that even the old people can be infected with the typhoid fever. The old people have their immunity compromised, and hence they need to be informed and be helped to observe high levels of hygiene because of low levels of immunity which is a factor in the infections of the typhoid fever.

Table 7 Comparison of Malaria & Typhoid Fever

		Frequency	Percentage
Valid	Yes	15	7%
	No	123	56%
	I don't Know	82	37%
	Total	220	100%

Only 15 (7%) of the respondents agree that there is a difference between the typhoid fever and malaria, 123 (56%) of the respondents say there is no difference between the two diseases while 82 (37%) of the respondents do not know and or are not sure if there is any difference between the two diseases. Again this is a misconception and there is therefore need for the community to gain proper and appropriate knowledge on typhoid fever causes, complications, severity and symptoms and how this can be controlled and or prevented.

Figure 1 Healthy persons' symptoms and typhoid fever

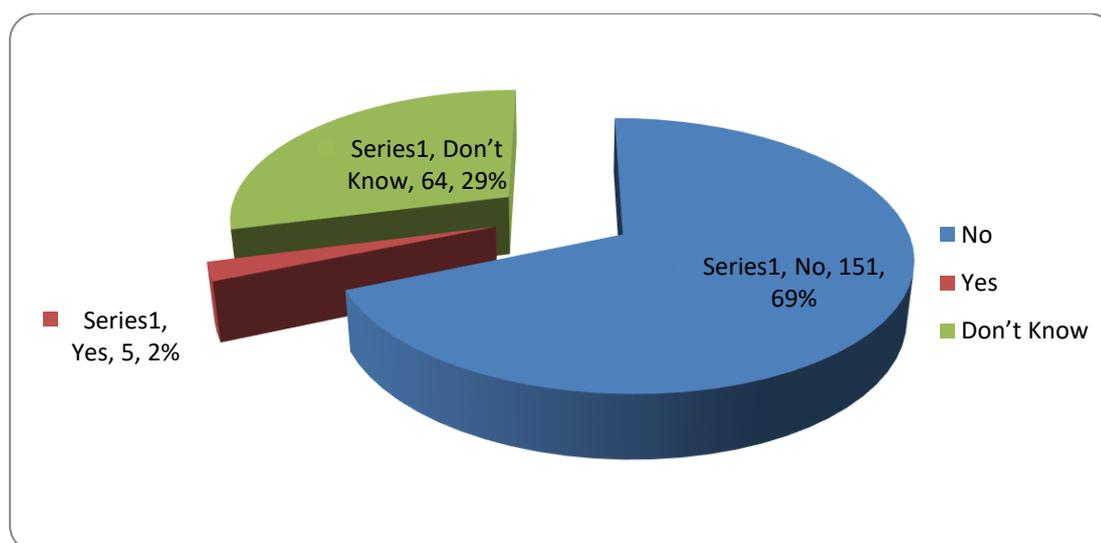


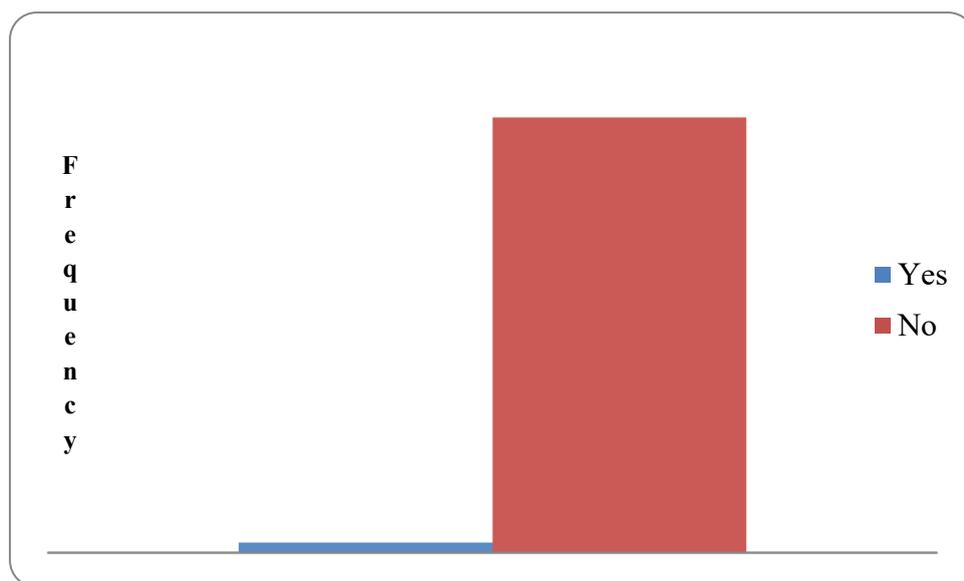
Figure 1 above shows 152 (69%) of the respondents saying that a healthy looking person cannot be suffering from typhoid fever, while 64 (29%) of the respondents do not know if a person who is healthy and going about with his or her normal duties can suffer from typhoid fever. 4 (2%) of the respondents agreed that even a healthy looking person can suffer from typhoid fever. This is an indication that there is scanty knowledge on the communication of the typhoid fever from one person to the other and on how long the symptoms take to disappear after one has undergone treatment.

Table 8 : Communication of typhoid

		Frequency	Percentage
Valid	Yes	0	0%
	No	138	63%
	I don't Know	82	37%
	Total	220	100%

From table 8 above, 138 (63%) of the respondents believe that typhoid fever cannot be communicated or passed from one individual to another. 82 (37%) of the respondents do not know if typhoid fever can be communicated from one person to another, while none of the respondents agreed that typhoid fever can be communicated from one person to another. This clearly shows that the people do not have adequate knowledge or facts on typhoid fever as typhoid fever is communicated from one person to another yet a high percentage (63%) of the respondents say that it is not a communicable disease. This greatly impacts on the management of the fever, despite many efforts to manage the fever.

Figure 2 Knowledge on prevention & control of typhoid fever



From figure 2 above, only 10 (5%) of the respondents have gained knowledge on the prevention and control of typhoid fever while 210 (95%) of the respondents have never gained any knowledge on the control and prevention of typhoid fever. This indicates that the people in Bungoma County have scanty knowledge on the facts about typhoid fever, thus posing a big challenge on the management of the fever.

There was therefore need to know how some of the respondents in Bungoma County had gained knowledge on typhoid fever either through the media, seminars or training. The responses are as shown in the table below.

Table 9 Sources of typhoid fever Knowledge.

	Media	Seminars	Training
Males (n=6)	4 (67%)	2 (33%)	0 (8%)
Females(n=4)	2(50%)	4 (100%)	0 (10.8%)
Totals(N)=10	6 (60%)	6 (60%)	10 (0%)

Respondents were asked how they had attained information or knowledge on how the causes, control and management of typhoid fever. 10 (5%) respondents confirmed having attained such knowledge as shown in the table above. The main sources of typhoid fever Knowledge for the 10 respondents were the media and seminars and none had attained any knowledge through training. When asked if they had disseminated the Knowledge

gained, 2 (20%) of the 10 respondents confirmed having disseminated typhoid fever related information. The information had been disseminated to friends, peers, family and relatives. This also indicates that there are a few people who have gained knowledge on the management of typhoid fever, hence this impact greatly on the management of the fever in Bungoma County.

From the foregoing data on knowledge on typhoid fever, there is clear indication that the knowledge they have is just misconception. There was hence the need to know what people in Bungoma County do when they are sick whether they buy medicine or go to hospital or use the herbal medicine. The following table 10 below indicates what people in Bungoma County do when they are sick.

Table 10 What people do when they are sick

Characteristics	Category	Frequencies	Percentage
Go to hospital	Yes	55	25
	No	165	75
	Totals (n)	220	100
Buy medicine	Yes	86	39
	No	134	61
	Totals (n)	220	100
Use herbal medicine	Yes	163	74
	No	57	26
	Totals (n)	220	100

Table 10 above indicates that 55 (25%) of the respondents said that when people are sick in the household, they go to the hospital while 165 (75%) of the respondents said that when people are sick they do not go to the hospital because the hospitals are far and because they lack financial resources to go to the hospital where they are required to pay a small fee before treatment.

Table 10 above also shows that 86 (39%) of the respondents said that people in the household buy medicine from the local stockist when they are sick while 134 (61%) of the respondents said that when sick people do not buy medicines due to lack of money to buy medicine.

On the use of herbal medicine, 163 (74%) of the respondents said that when people are sick in the household, they use herbal medicine while 57 (26%) of the respondents said they do not use herbal medicine. It was also discovered that there is a strong believe in the traditional healers who are first visited before individuals can go to the hospital. They visit the hospitals after the traditional healers have failed in the treatment of the diseases.

Discussion of findings

Influence of knowledge on the management of typhoid fever

Generally, the level of knowledge about typhoid fever was low hence the level of typhoid knowledge is important in the control of typhoid fever as noted by Malisa & Nyaki (2010) that inadequate knowledge about personal hygiene, scarcity or lack of access to safe water, improper drainage and problems of unsanitary toilets are some of the obstacles to typhoid fever control. A majority of the respondents were able to state the symptoms of typhoid fever correctly and methods of control and prevention against the typhoid fever. This was also noted in a study done in Singida region in Tanzania where the study noted that while 88% of the respondents were aware of the typhoid disease, 53% of them were unaware of its control methods Malisa & Nyaki (2010). Most respondents also showed wrong perceptions about typhoid fever and some gaps in knowledge and certain misconceptions about typhoid fever were also noted. Most of the respondents did not know the difference between typhoid fever and malaria and or other diarrhoeal diseases; similarly, some of the respondents thought that only certain people or groups of people are susceptible to typhoid fever. Also, quite a sizeable proportion of respondents still had the perception that typhoid fever can be transmitted through mosquito, being rained on or and chewing sugarcane. Although the etiologies of Typhoid fever and malaria are different, Typhoid fever being caused by bacteria and malaria by a protozoan and transmitted via different mechanisms, both diseases share rather similar symptoms (Uneke, 2008). This is the reason why most of the respondents could not really tell the difference between typhoid fever and malaria symptoms.

These findings clearly show that despite the fact that members of the communities in Bungoma County have some knowledge about typhoid fever, there were still some gaps in knowledge about the typhoid fever which impacts on the management of typhoid fever in the County. For instance, majority of the respondents seemed aware of the typhoid fever and some of them associated it with drinking of unboiled water. It was also clear that majority of the participants were also informed of some of the signs of typhoid fever such as headache and stomachache. However, very few were aware of the mode of transmission and control. Some of the participants who said that the fever is transmitted through unboiled water could not explain how the water gets contaminated. On the other hand, discussions with the health workers showed that they were informed of the transmission and control of the typhoid fever. Most indicated that it is transmitted through the faecal-oral route. The health workers advocated for health educational programmes as control measures where the communities are to be educated on the importance of hygienic practices, particularly hand washing before eating and preparing food and after

going to the toilet.

Gaps in knowledge and inaccurate perceptions displayed by some respondents of this study could be an indicator that either certain aspects about typhoid fever are difficult for some community members to comprehend or could be a reflection that the authorities concerned use poor methods to impart typhoid fever related knowledge. This has also been noted by Chinsebu K.C *et al* (2008) who notes that programmes to manage typhoid fever may be strengthened by use of indigeneous understanding of the disease. However, one key informant also informed the researcher that community members had lost interest on issues related to health generally and that health related information no longer elicits the kind of response it did several years ago. This was largely due to the low income levels amongst most of the community members and hence the high poverty levels which impact greatly on the management of typhoid fever.

These findings have important implications in terms of community efforts to minimize typhoid fever related issues in Bungoma County. This has also been noted by Malisa & Nyaki (2010) whose findings indicated that the level of typhoid awareness had a huge implication in the implementation of typhoid control measures and highlighted the need for an intensive educational campaign to ensure adherence and the practice of personal hygiene in general. Knowledge about typhoid fever is a necessary albeit insufficient condition required to bring about modification in behavior of the people in Bungoma County. Knowledge empowers members of the community to dispel unfounded fears and anxieties. Thus, gaps in knowledge and inaccurate perceptions displayed by some members of the community in the County can lead to fatalistic beliefs regarding typhoid fever or chances of suffering from typhoid fever.

The factors such as the level of education and economic status play a significant role in making the effect of specific sanitation measures difficult to establish. The relationship between age, sex, and socio-economic status and typhoid morbidity rate was also established. For instance, it was found out that the young age groups, the females and the poor were the most affected, while women in particular if they are carriers then many people in the family will be affected. The transmission of typhoid fever varies under different climatic, socio-economic and cultural conditions and they do determine to a great extent the level of morbidity rates. For instance the rapid decline of typhoid in the United States during the last few decades is primarily due to the rapid changes in the environmental conditions and standards of personal hygiene. These are the most important and decisive factors determining the actual level of morbidity in a community.

RECOMMENDATIONS

The study recommended that the Public Health officials should offer continuous Public Health Education to the communities and not to wait when there is a disease outbreak so as to offer public health education. This will enhance people's knowledge on disease etiology which will influence the management of the typhoid fever.

LIMITATIONS

The study was carried out only in Bungoma County in Kenya and as a result, the study may not be duplicated to other counties due to difference in resource endowment in different

counties. The cultures are also different in different counties hence the results may not be duplicated to other counties.

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