

FACTORS CONTRIBUTING TO INCREASED CASES OF TYPHOID FEVER AMONG PATIENTS AGED 15-45 YEARS IN SOROTI REGIONAL REFERRAL HOSPITAL, SOROTI DISTRICT. A CROSS-SECTIONAL STUDY.

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Abstract

Background:

This study aimed at determining the factors contributing to increased cases of typhoid fever among patients aged 15-45 years in Soroti Regional Referral Hospital, Soroti District.

Methodology:

A descriptive study design employed both qualitative and quantitative data collection, simple random sampling technique was used.

Results:

The majority of respondents 85% had heard of typhoid fever, 52% do not complete treatment for typhoid when they fall sick, 64% of them do not have latrines, and out of the few with them 84% do not have latrines covers and 52% do not know what contaminates water in their community. 42% get their water from the tap, 58% dispose of their wastes in their backyards of homes, 40% eat food from their homes, they do not follow proper hygienic methods of food handling, and 70% do not treat or boil drinking water. half 50% of the respondents move long distances to seek medical services.

Conclusion:

Most people do not complete their treatment for typhoid fever, do not know how typhoid fever is transmitted from one person to another, that there was miss management of waste, and food, do not boil water for drinking, the majority do not have latrines, move long distances to seek health services, the health facility does not have required laboratory equipment's to facilitate routine typhoid testing and diagnosis, and gaps in the general examination of patients were discovered.

Recommendations :

Uganda National Water and Sewerage Corporation should improve water supply and treatment, sensitization of people on how to prevent communicable diseases by the Centre Disease Control and Prevention through the Ministry of Health and more health workers should be recruited to improve service delivery. People in the community should be encouraged to boil water before drinking and routine of the health facility for general body checkups.

Keywords: Factors, Typhoid fever, Soroti Regional Referral Hospital., Submitted: 2023-07-06
Accepted: 2023-08-18

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1. BACKGROUND OF THE STUDY.

Typhoid fever is a systemic disease caused by salmonella Typhi a Gram-negative bacterium. Humans are the only host and transmission most commonly occurs through ingestion of water or food contaminated with feces from an acutely ill or convalescent patient or an asymptomatic carrier. The hazard of the disease is high in Under-developed Countries where typhoid salmonella is endemic due to poor hygiene and Sanitation and the non-availability of safe sustenance and water (Antillon M, Warren JL& Crawford FW, 2017)

The classic presentation of typhoid fever is fever, malaise, diffuse abdominal pain, and constipation and if untreated may progress to delirium, intestinal hemorrhage, bowel perforation, and death within one month of onset. Survivors may be left with long-term or permanent neuropsychiatric complications.

Typhoid fever has become a threat to many tropical countries showing a worldwide estimate of about 212 million cases with 129,000 deaths yearly with children and young adults being the vulnerable groups. *Challenges and opportunities for typhoid fever control: A call for coordinated action*. In 2017, typhoid and paratyphoid fever were estimated to cause 10.9 and 3.4 million illnesses globally.

The recommended test to confirm if the person has an enteric fever is to grow the salmonella from their blood (L Wijedoru, 2017). It takes at least 48 hours to give a result, so cannot help healthcare workers make a diagnosis the same day the blood culture is taken. Therefore, rapid diagnostic tests (RDT) that are widal are diagnosed to be easy to use and to deliver quick results without a need for blood culture (LalithWijedoru, 2017)

In Southeast Asia and the central South on assessment of knowledge and risk perception towards typhoid fever, enteric fever incidence was estimated to be 219.8 per 100,000 populations.

In Europe in 2014 the highest incidence rates of typhoid fever were reported by France (0.65 cases per 100,000 population), the United Kingdom (oper 100,000), and Denmark (0.48 cases per 100,000), (J Kasadha, 2022). ((Cyprus, Hungary,

Iceland, Latvia, Malta, Romania and Slovakia) (ControlECfDPa. Typhoid and paratyphoid fever (2016).

In Indonesia, a study conducted in the slums of Jakarta estimated the incidence rate of typhoid, (Sandra, 2016), 148.7 per 100000-person per year Typhoid and paratyphoid fever in the age group 2–4 years old, 180.3 in the age group of 5–15 years old and 51.2 in those over 16 years of age, with a mean age of onset of 10.2 years, (Alba, S et al, 2016).

In Africa it is estimated about a total of 400,000 cases occur annually with an incidence of 50 per 100,000 persons per year, “Seasonal variation and recent status of typhoid fever in a tertiary care hospital”. *International Journal of Endorsing Health Science Research* 2.2 (2014).

In the Lao People’s Democratic Republic that the annual incidence of typhoid was 4.7 per 100,000 persons and paratyphoid was 0.5 per 100,000 persons, (J Kasadha, 2022)

In Uganda, the incidence rate of Typhoid fever at the national and district levels was ~ 160 and 60 cases per 100,000 persons per year, respectively, predominantly in urban areas, (BB Mirembe, 2019).

Countries like Uganda, with a very high population growth rate and ample annual participation but with inadequate safe water access experiences multiple large outbreaks of typhoid every year For example, a recent typhoid outbreak in Kampala capital city was attributed to unconfined aquifer which 10,230 suspected cases and 1,920 of which were confirmed.

1.1. Objective of the study.

To determine the factors that contribute to increased cases of typhoid fever among patients aged 15-45 years in Soroti Regional Referral Hospital, Soroti district.

2. METHODOLOGY.

2.1. Study area.

The study was conducted in Soroti Regional Referral Hospital which is located in Soroti district in the Eastern part of Uganda with approx-

imately 371,986 people that is to say 190,587 females and 181,399 males. Soroti district is 193 kilometers from Kampala district. The health facility was established by the government and funded by the local government and the Ministry of Health to provide health care services to the members of the community. The Health Centre offers services like Antenatal care, Maternal and child health care services, HIV/AIDS counseling testing and treatment, conducts birth deliveries, and management of medical conditions, and they also have a functioning Laboratory. They also offer inpatient services to patients. It receives referrals from all hospitals and other health centers within the district.

2.2. Study design.

The study was a descriptive quantitative cross-section study with the use of self-administered questionnaires.

2.3. Study population.

The study was carried out among the patient aged 15-45 years who attended the outpatient clinic. It included all men and women with or without typhoid at that moment. It also included those ever suffering from typhoid and those who had ever suffered from it in the previous two months.

2.4. Sampling technique and procedure.

A simple random sampling technique was employed in the study since respondents were obtained from only outpatient clinics (OPD).

At the outpatient clinic, all patients who were willing to participate in the study were registered and assigned numbers. Then the sample size was obtained. Then the number of willing patients was noted on a piece of paper. The pieces of paper were put in the basket and shared to mix them up. Then the clinician on duty who was neutral was invited to pick the desired number of respondents. Then patients with the numbers picked by the clinician were given questionnaires to participate in the research.

2.5. Sample size determination.

The sample size was determined using Burton's formula (1965) $Sample\ size\ (n) = QR/O$

Where,

Q- Total number of days taken for data collection

R- Maximum number of respondents who were interviewed per day
O- Maximum time taken on each respondent per day.

Values: Q= 10 days R=5 respondents.

O=1 hour (Time duration was from 8 am- 1 pm each day) Therefore, $n = QR/O$

$N = (10 \times 5) / 1$

=50 Respondents

Sample size of 50 respondents was used

2.6. Sampling criteria.

2.6.1. Inclusion criteria.

All patient who was voluntarily willing to participate in the study. All patients aged 15-45 years.

Patients who were suffering from typhoid by that time.

Patients who had ever suffered from typhoid for the last two months.

2.6.2. Exclusion criteria.

Unwilling patients by the time of carrying out the study. Patients out of the age bracket that is below 15 and above 45. Mentally ill patients.

Drunkard patients.

2.7. Study variables.

2.7.1. Dependent variables.

Increased cases of typhoid in patients aged 15-45 years.

2.7.2. Independent variables.

Factors contributing to increased cases of typhoid in patients aged 15-45 years.

2.8. Data collection tool.

A well-structured questionnaire organized in English was used in the collection of data during the study. Then a questionnaire was translated into the local language (Iteso). It consisted of four sections that are demographic

data of the respondent, sections for individual factors, community-related factors, and health-related factors. The questionnaires were self-administered by the researcher.

2.9. Pre-testing of the questionnaire.

The questionnaires were pre-tested in general hospitals and health centers in Soroti district. Pre-testing was intended to determine the validity and reliability of the questions in the questionnaires.

2.10. Data collection procedure.

The requisition letter for research data collection of data at SRRH was gotten from the principal of Kampala School of health sciences and taken to the hospital. Then the research coordinator of the hospital gave me a letter that allowed me to collect data from patients at an outpatient clinic. Sampling of the patient took place using simple random sampling. Then the sampled patients were given the questionnaire in the language they understand either English or It sot by self-administering. After the questionnaires were collected from the respondents and checked for completeness. Then they were taken for analysis.

2.11. Data management and analysis.

After the collection and checking of questionnaires for completeness and accuracy, data was analyzed manually using tally sheets. The information was arranged in graphs, pie charts, tables, and frequency distribution.

2.12. Ethical consideration.

A letter of acceptance to carry out the research in SRRH was first obtained from the research coordinator of the hospital before the study commenced.

All respondents had to be explained to very well the topic of the research, its objectives, and its significance, then informed consent to participate in the research was given to them. The patients' decision either to participate in the study or not was accepted and respected.

The information obtained from the respondents was kept confidential since they were not to write their names on the questionnaires.

3. STUDY FINDINGS.

3.1. Social demographic characteristics of respondents.

From table 1a, half of respondents (50%) were between the age range of 26 to 35 years, and minority (10%) of the respondents were 15 to 25 years of age, and the minority 24% of the respondents had atleast completed their secondary level , majority of respondents 60% did not have where to work and minority 8%of the respondents were public servants and majority of the respondents (70%) were Itesots, and the minority (4%) of the respondents were from other tribes.

Regarding the sex, majority 76% of the respondents were females and the minority 24% of the respondents were males. majority of respondents 40% completed their tertiary level of education. (Table 1b)

3.2. Individual related factors contributing to increased cases of typhoid fever.

From the figure 1 ,results show that majority of the respondents (85%) had ever suffered from typhoid fever and minority of the respondents (15%) had never suffered from typhoid fever.

From table 2, results show that majority 40 (80% of the respondents do not complete their treatment for typhoid fever and the minority 10 (20%) of the respondents completed treatment for typhoid fever when they fell sick.

From table 3, the majority 39(78%) said they never completed the dose on treatment because it was expensive and minority 3(6%) said the treatment was not available.

From the figure 2 ,results show that majority of the respondents (64%) do not boil drinking water while minority of the respondents (36%) take boiled water.

From table 4 the majority 39(78%) said they did not take boiled water because it was expensive and minority 3(6%) said that it wastes their time.

From figure 3, results showed that majority 54% of the respondents only washed hands when they were going to eat and minority 10% of the respondents do not totally wash their hands.

Age	Frequency(f)	Percentage (%)
15-25 years	05	10
26-35 years	25	50
36-45years	20	40
Total	50	100
Tribe		
Kumam	10	20
Ateso	35	70
Acholi	03	6
Others	02	4
Total	50	100
Occupation		
Unemployed	30	60
Public servant	04	8
Businessman/ woman	16	32
Total	50	100
Education level		
Primary	18	36
Secondary	12	24

Table 1a)Shows the distribution of respondents according to their demographic data.(N=50)

Tertiary	20	40
Total	50	100
Marital status		
Single	24	48
Married	09	18
Divorced/ Separated	10	20
Cohabiting	7	14
Total	50	100
Sex		
Male	12	24
Female	38	76
Total	50	100

Table 1b)Shows the distribution of respondents according to their demographic data.(N=50)

Response	Frequency	Percentage (%)
Yes	40	80
No	10	20
Total(n)	50	100

Table 2: Shows the distribution of respondents according to whether they completed treatment of typhoid or not. (N=50)

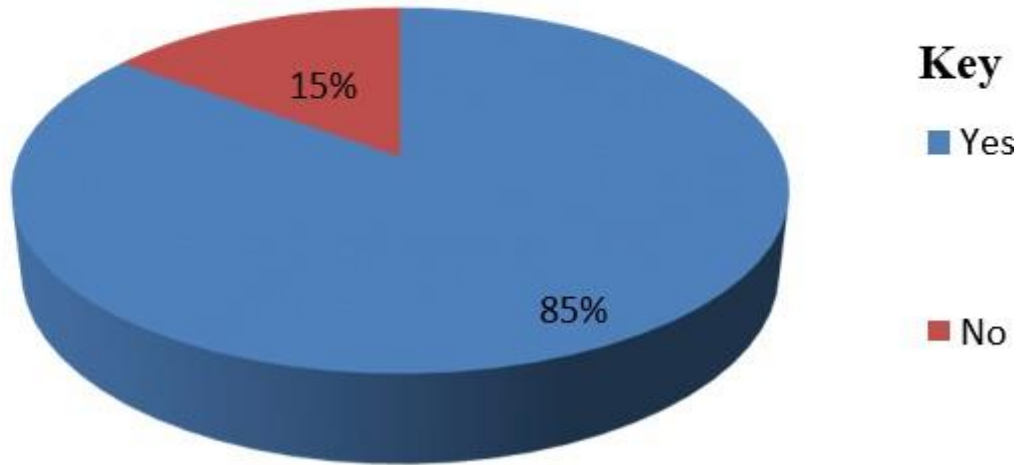


Figure 1: Shows the distribution of respondents according to whether they had ever suffered from typhoid fever.(N=50)

Response	Frequency	Percentage (%)
Never wanted	04	8
Treatment was not available	03	6
Treatment was expensive	39	78
Others	04	8
Total(n)	50	100

Table 3:Shows the distribution of respondents according to why they did not complete the treatment. (N=50)

Response	Frequency	Percentage (%)
It is expensive	39	78
Wastes a lot of time	03	6
Do not have time to boil water	39	78
They use spring water	04	8
Total (n)	50	100

Table 4: Shows the distribution of respondents according to why they did not take boiled water. (N=50)

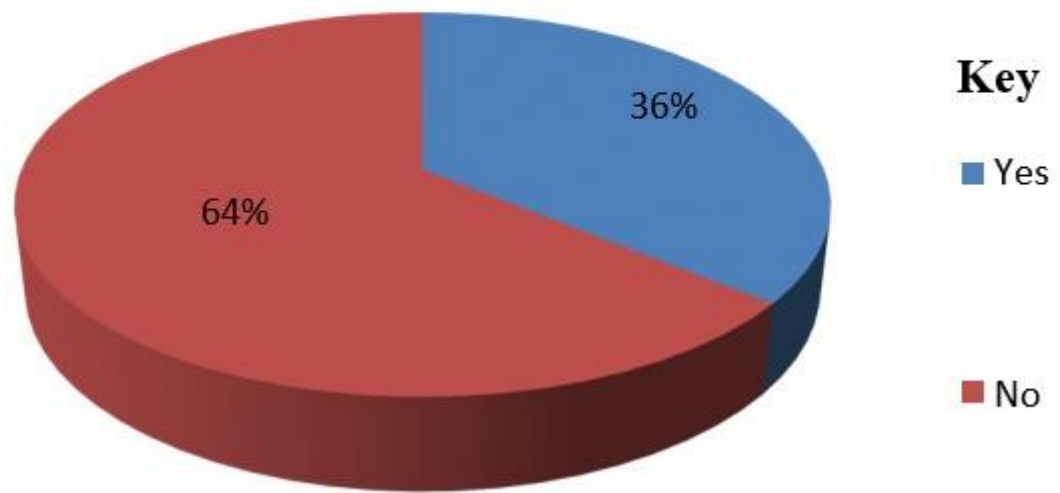


Figure 2: Shows the distribution of respondents according to whether they boiled their water for drinking.(N=50)

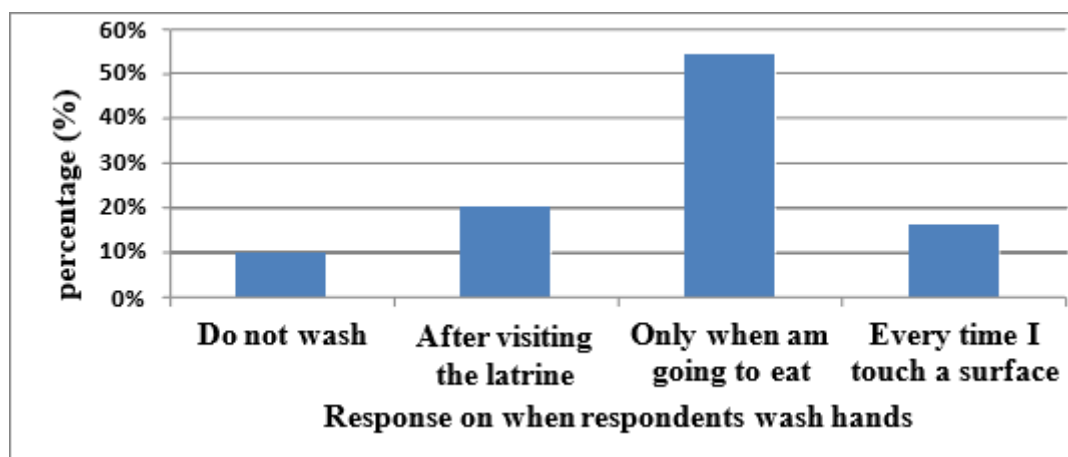


Figure 3: Shows the distribution of respondents according to how often do respondents wash their hands.(N=50)

Response	Frequency	Percentage (%)
Pit latrine	10	20
I do not have one	31	62
I do not know	4	8
Toilet	5	10
Total (n)	50	100

Table 5: Shows the distribution of respondents according the type of latrines they had. (N=50)

From table 5, results showed that majority 31(64%) of the respondents did not have latrines and minority 4 (8%) of the respondents do not know the type of latrines they have.

From figure 4 results show that majority 80% of the respondents who have pit latrines lack pit latrine covers and minority 20% of the respondents who have pit latrines have pit latrine covers.

3.3. Community related factors contributing to increased cases of typhoid fever.

From table 6, results show that the most 42% of the respondents got their water from the tap and least 2% of the respondents get their water from spring.

From the figure 5 , results showed that more than a half of the respondents 52% did not know what contaminated water in their community and minority of the respondents 8% said that water is contaminated by animal and human wastes disposed near water source.

From figure 6 results show that more than a half (58%) of the respondents disposed their wastes in the backyards while minority (2%) of the respondents buried wastes in the ground.

3.4. Health related factors contributing to increased cases of typhoid fever.

From table 7 results showed that half 50% of the respondents moved for above 5km from their homes to reach the nearby health facility and minority 14% of the respondents move for less than a kilometer to reach the nearby health facility.

From figure 7 results showed that almost all respondents 98% paid for testing for salmonella typhi while very few of the respondents 2% said that they did not pay for testing for typhoid fever.

From table 8 results showed that half of the respondents (50%) reported that health workers at the facility did not do general body checkup of patients when they were sick while minority of the patients (8%) said that health workers examined them when they were requested.

4. DISCUSSION.

4.1. Individual factors contributing to increased cases of typhoid fever among patients aged 15-45 years.

According to the study findings, the majority of the respondents (85%) had ever suffered from typhoid fever. This implies that typhoid fever awareness among people was very effective. This is in agreement with a study which was conducted by Basuta in Uganda (2019) on the incidence rate of typhoid; where it revealed 160 cases per 100,000 people per year.

Furthermore, results revealed that most of the respondents (80%) do not complete their treatment dose for typhoid fever when they fall sick. This is in agreement with the study conducted by ME Carey et al, 2019 on severe typhoid fever in Africa which showed that 25% of hospitalized typhoid fever patients had complications, and a 36% higher prevalence of complications among those patients who were as a result of failure to complete their treatment dose.

The study results also showed that most of the respondents (64%) did not have latrines and out of the few with pit latrines, most of them (80%) did not have pit latrine covers. In addition, the results also showed that the majority of the respondents (54%) only washed their hands when they were going to eat and (34%) of the respondents

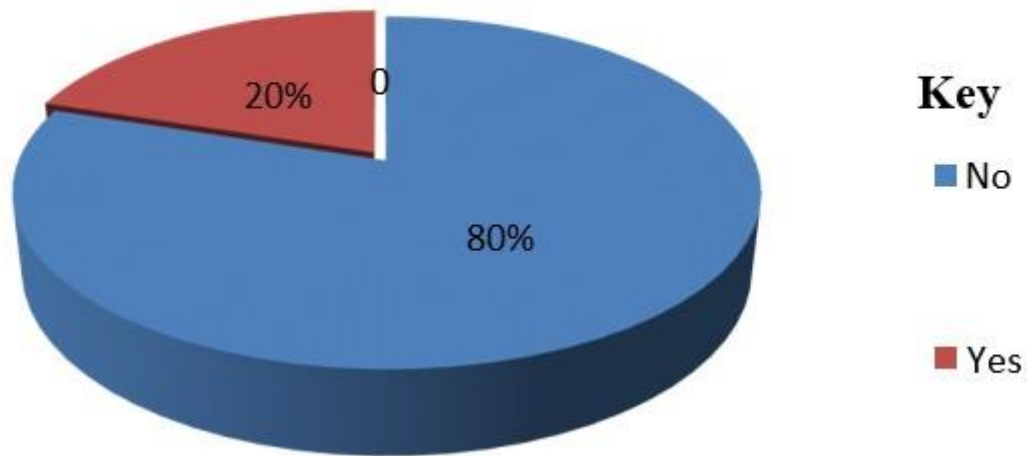


Figure 4: Shows distribution of respondents according to those who had pit latrines according to whether they had covers.(N=50)

Response	Frequency	Percentage (%)
Well	5	10
Springs	1	2
Borehole	14	28
Tap	21	42
Others	9	18
Total(n)	50	100

Table 6 :Shows the distribution of respondents according to the sourceof water in the community(N=50)

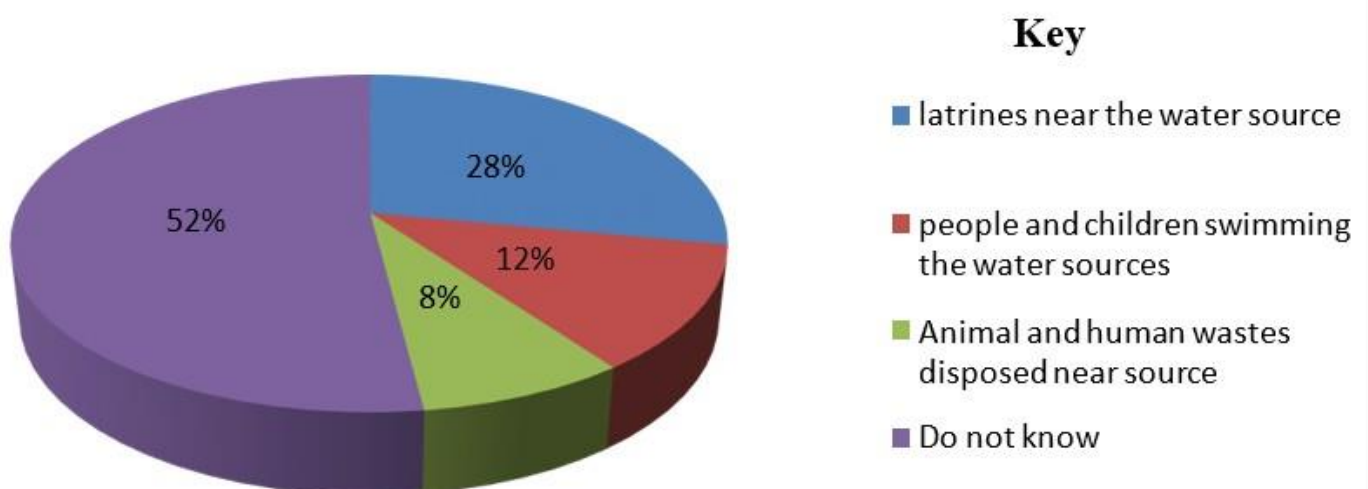


Figure 5: Shows the distribution of respondents according to what contaminates water in their community(N=50)

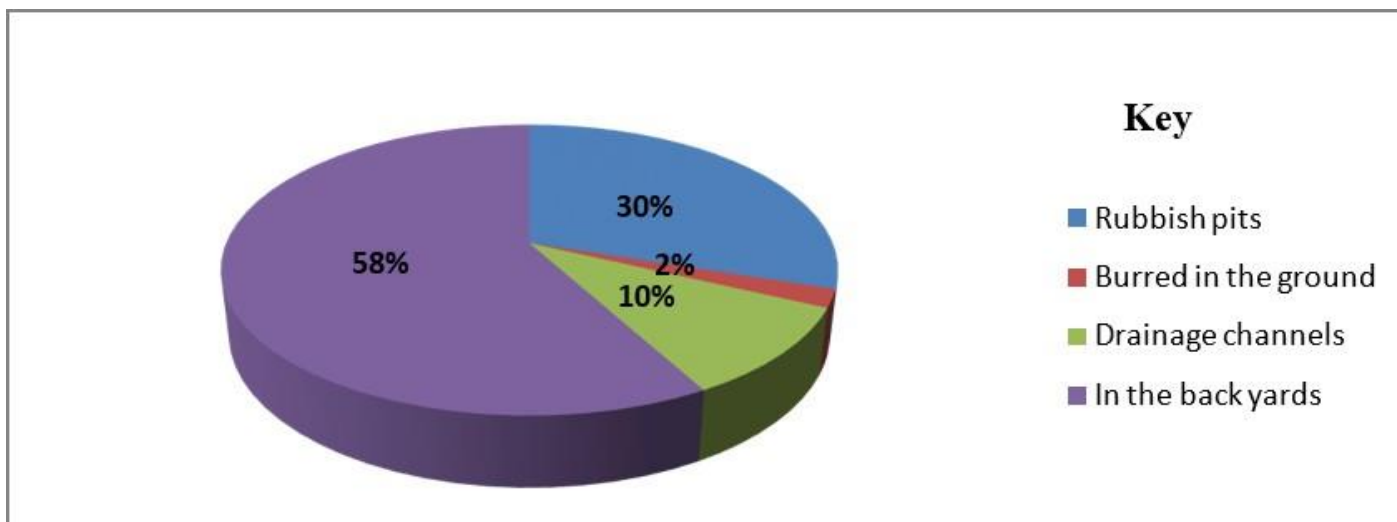


Figure 6: Shows the distribution of respondents according to how wastes are disposed in their community(N=50)

Response	Frequency	Percentage (%)
Less than 1km	8	16
1-3km	7	14
3-5km	25	50
Above 5km	10	20
Total(n)	50	100

Table 7:

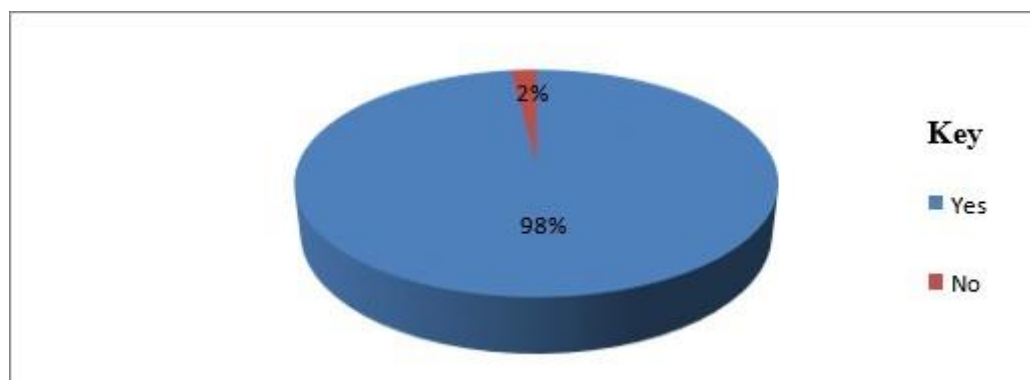


Figure 7: Shows the distribution of respondents according to whether they pay for testing for typhoid fever or not.(N=50)

Response	Frequency	Percentage (%)
Every time I fall sick	10	20
They do not examine	25	50
When they are requested to examine	4	8
I do not know	11	22
Total (n)	50	100

Table 8: Shows how often health workers do general body checkup of patients when they visit the health facility. (N=50)

did not mind washing. This implies that the majority of the respondents were not economically stable to afford to put up their own

latrines and also lacked enough knowledge on how dangerous was the practice of not washing hands while going to eat. This was in line with the study that was conducted by David Musoke et al. (2018) which showed that although the majority of households (86%) had latrines, the sanitary status found amongst most of them was poor which included a lack of hole covers (84%) and hand washing facilities (70%).

The study results showed that the majority of the respondents (52%) did not know what contaminates water in their community which also means that they do not know that typhoid fever can also be transmitted through drinking contaminated water. This was attributed to the inadequate knowledge about typhoid due to a lack of health education and sensitization by village health team personnel in the community on how typhoid fever is spread. This is in line with a study done by Dinkinesh Getachew, *et al* (2018), in Mendida Town, Ethiopia, which revealed that concerning the transmission about half (50.1%) of the respondents did not know that an infected person can transmit the disease to the health person.

4.2. Community-related factors contributing to increased cases of typhoid fever among patients aged 15-45 years.

The study results revealed that the majority of the respondents (42%) get their water from the tap. This implies that there is underwater pollution through the linkages of the water as it is carried in the pipes in the ground and also the poor or inadequate treatment of water by National Water and Sewerage Corporations (NWSC). This was in disagreement with the study that was conducted by Ajayi *et al*, 2015 in Nigeria which revealed that patients who sourced their water from a well had the highest frequency (57.64%) of typhoid fever.

Furthermore, the study revealed that the majority of the respondents (58%) disposed of waste in their backyards or homes more than other

methods of waste management. This therefore implies that there is poor sanitation in the community which is attributed to overcrowding of individuals in one area causing improper management of wastes. This is in line with a study that was conducted by the American Society of Tropical Medicine and Hygiene (2020), which revealed that unsafe waste management was a risk factor for up to 55% of patients with typhoid fever. In addition, results were also in line with the study conducted by David Musoke et al (2018), which showed that the main method of solid waste disposal was dumping in open pits and then burning (55%) while others buried it (11%), disposed of it indiscriminately (18%), or used skips (7%). Only 40% of the households were satisfied with the solid waste management services in their community. In addition, 48% of households lacked dustbins.

The study results show that the majority of the respondents 40% eat food from their homes than food vendors reducing the times they buy food from vendors. This was attributed to the fact that the majority of the individuals did not trust the safety of food from vendors with a fear of transmitting typhoid to them and others took it too expensive for them. This is in this disagreement with the study conducted by Galgallo et al., 2015 in Moyale Sub-county, Kenya, where 55% of the respondents used to eat from food vendors.

From the finding's majority of the respondents (70%) do not treat their drinking water or boil it. Therefore, this implies that sensitization of individuals on the importance of boiling drinking water in the prevention of typhoid was not effective, Galgallo et al, 2015. This was because people did not know that typhoid fever can spread through drinking contaminated water and also that boiling can help to kill salmonella typhi which causes typhoid fever. This is in agreement with the study that was conducted by the American Society of typhoid medicine and Hygiene (2020), where results showed that drinking untreated water was a risk factor for 69% of patients with typhoid fever and in the study conducted by Dinkinesh Getachew, et al. (2018), conducted a study in Ethiopia, only (23.2%) of the respondents treated their drinking water.

4.3. Health facility-related factors contributing to increased cases of typhoid fever among patients aged 15-45 years.

The study findings showed that half of the respondents (50%) move for a distance above 5km from their homes to reach the nearby health facility and this leaves many respondents presenting late to a health facility. This was attributed to the lack of a nearby health facility where they can assess the health service in time before complications. This is in line with the study conducted in 2016 by V Mogasale, 2015, which reported that only 24 % of febrile episodes identified from house-to-house visits had ≥ 3 days of fever and the rest were not referred to an index surveillance facility. sometimes only a fraction of people are identified at community reach index surveillance facilities as observed in Karachi where 30 % of 4198 febrile illness cases with more than 3 days of duration are presented at the health facility says V Mogasale, 2015.

Furthermore, the study also revealed that almost all the respondents (98%) who presented with signs and symptoms of typhoid fever paid money before being tested for salmonella typhi. This is attributed to the limited blood culture and diagnostic facilities of the health facility which needed to take samples elsewhere for testing. This is in line with the study that was conducted in the Singida area in Tanzania (2015) which revealed that 75% of health facilities had a shortage of diagnostic laboratory services.

The study findings revealed that half of the respondents (50%) said that health workers did not do general body checkups including the vitals of patients when they are sick. This implies that some medical workers miss cardinal findings on examination which are attributed to the heavy workload of patients per day to the health workers ratio at the facility hence little time is given to each patient.

5. CONCLUSION.

Regarding individual factors, the study discovered that most of the respondents did not complete their treatment for typhoid fever when they

fall sick causing complications of the disease in late stages and also becoming carriers, therefore, spreading the infection, majority of respondents did not have latrines and out of the few with pit latrines lack pit latrine covers. In addition, they also only washed their hands when they were going to eat hence making it difficult to break the transmission chain.

Regarding community-related factors, the study discovered that the majority of the respondents got their water from the tap and in addition agreed that this water gets contaminated by underwater pollution of linking pipes, there was miss managing of wastes amongst respondents where most of them disposed of wastes in the open backyards only a few of them were satisfied with waste management and most respondents did not treat their drinking water neither boiled it and to some extent individuals also bought unboiled water packed in polythene bags "buvera".

On health-related factors, the study discovered that half of the individuals move long distances of above five kilometers which is expensive for them leaving many not attending the health facility for health services, diagnostic investigations, and all other routine tests for typhoid fever were paid for and it was also discovered half of the respondents agreed that health workers did not do general body checkups of patients when they are sick hence some medical workers miss or poorly diagnose the patients.

6. RECOMMENDATIONS.

The government of Uganda through the National Water and Sewage Corporation should improve the coverage and treatment system of water for drinking and domestic use.

The government of Uganda through the Ministry of Health and the Centre for Disease Control and Prevention (CDC) sensitize people about the importance of promoting proper hand washing and constructing latrines in the community, should recruit more health workers to improve service delivery at the health facility. and should build more health facilities in the area and also promote the existing ones and strengthen the

higher National Drug Authority (NDA) to supply the required testing and diagnostic supplies to increase the services offered.

Health workers at Soroti Regional Referral Hospital must always health educate individuals about the causes, risk factors, signs, and symptoms of typhoid as well as preventive measures and seek quick medical intervention in case of infection.

The individuals in the community should be encouraged to boil water for drinking and discourage them from eating leftovers and also encourage the properly cover food in case it remains.

7. ACKNOWLEDGMENT.

I am distinctively so grateful to the Almighty God for being with me all the time, and in particular for His care and protection throughout my entire study and for taking me this far. I consequently owe all my achievements to Him.

Thanks also go to Mr. Mubangizi Prosper my supervisor who directed me during my study from the beginning to the end and corrected all my mistakes to ensure perfection.

My utmost sincere appreciation goes to the administration of Kampala School of Health Sciences. Mubangizi Prosper the principal for having provided a good learning environment for me up to the accomplishment of this course.

My exceptional and profound gratitude to my beloved family especially my wife, Mrs. Wamere Brenda, and Sr. Ariokot Joan Racheal who have been so supportive and influential throughout my entire course. Thank you so much Mum for your endeavor support, prayers, and the financial support we jointly offered for the course.

I also appreciate my classmates for example Okello Martin who has always been there for me throughout the time of doing my course.

I dedicate this report to my beloved Father Mr. Emienu Julius and my mother Ms. Abwalo Stella for the financial and social support, I love you so much and any other kind of support rendered to me academically and guidance towards the accomplishment of my course thank you very much may the good LORD reward you abundantly.

8. ABBREVIATIONS AND ACRONYMS.

CME : Continuous medical education

DHO : District Health Officer

GTVP : Global Typhoid Vaccination Policy

MDR : Multi Drug Resistance

MOH : Ministry of Health

OPD : Outpatient Department

PTF : Paratyphoid fever

SRRH : Soroti Regional Referral Hospital

TCV : Typhoid Conjugate Vaccine

TF : Typhoid fever

UAHEB : Uganda Allied Health Examinations Board

WHO : World Health Organization

9. Publisher details:

Publisher: Student's Journal of Health Research (SJHR)

(ISSN 2709-9997) Online

Category: Non-Governmental & Non-profit Organization

Email: studentsjournal2020@gmail.com

WhatsApp: +256775434261

Location: Wisdom Centre, P.O.BOX. 148, Uganda, East Africa.



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