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A CROSS-SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS TYPHOID FEVER PREVENTION AMONG PATIENTS AGED 18-45 YEARS, KAJJANSI HEALTH CENTRE IV, WAKISO DISTRICT.

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Abstract

Background

Typhoid fever is a systemic infection caused by Salmonella Typhi. This gram-negative bacterium is transmitted through the ingestion of contaminated food, beverages, and water due to poor sanitation and hygiene. This study assessed knowledge, attitude, and practices towards typhoid fever prevention among patients aged 18-45 years, Kajjansi Health Centre IV, Wakiso district.

Methodology

The study employed a quantitative research design, utilizing questionnaire method, interviewing method, and document reviewing method to collect and analyze data from a sample population of 30 respondents.

Results

30% of the participants had no formal level of education, the majority (70%) of the respondents knew typhoid fever, and many of them (60%) knew that it spreads through drinking contaminated water. Regarding attitude towards typhoid fever prevention, the majority (90%) thought it was important to prevent typhoid fever. Regarding practices, the biggest percentage (75%) of the respondents always wash their hands with soap before eating, the majority (80%) of the respondents always drink boiled water, and most (40%) of the respondents seek treatment from public hospitals when they suspect typhoid fever.

Conclusion

Based on these findings, it can be concluded that the knowledge, attitude, and practices of the respondents towards typhoid fever prevention among patients aged 18-45 years at Kajjansi Health Centre IV, Wakiso District were generally good during the study.

Recommendations

Health workers in Kajjansi Health Centre IV should promote community health-based programs to teach the community the best practices to curb the increasing typhoid fever.

Keywords: *Typhoid fever prevention, clients aged 18-45 years, Kajjansi Health Centre IV, Wakiso District.*
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Background

Typhoid fever is a systemic infection caused by Salmonella Typhi, a gram-negative bacterium, through ingestion of contaminated foods, beverages, and water as a result of poor sanitation, hygiene, and handling infected objects and contaminating public foods and beverages (WHO, 2018, and CDC, 2020). It is a global public health threat that is more pronounced in developing countries like India and Africa, especially Uganda, characterized by poor sanitation, unsafe water supply, and unsafe water chains. High-risk areas are the Indian subcontinent, South and South East Asia, the Middle East, Latin America, and Africa (Mogasale et al, 2014). In the acute phase, the illness is characterized by fever, chills, headache, nausea, loss of appetite, constipation, and sometimes diarrhea associated with abdominal pain. When untreated, typhoid fever progresses to delirium, intestinal hemorrhage, and bowel perforation, which is fatal (Mogasale et al, 2014).
Transmission of typhoid fever occurs orally via foods and beverages handled by asymptomatic carriers. Consumption of food from street vendors has been implicated in Salmonella paratyphi A and paratyphoid fever infection in communities. Besides, hand-to-mouth occurs when hand hygiene is neglected after using contaminated toilets. However, oral transmission also occurs when individuals take sewage-contaminated water in the process of water supply and usage. This thus necessitates a safe water chain, totally led sanitation, food hygiene, and hand hygiene at all times in our communities (CDC, 2020) and (Keith et al, 2018). Globally, an estimated 9 million cases occur with 110,000 deaths annually, out of which developing countries contribute a

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significant percentage of 2.1% of the total cases and deaths (WHO, 2019). It is a potentially fatal infection of multi-system infection caused primarily by Salmonella enteric, a sub spices enterica serovar typhi (WHO, 2018) and (Keith et al, 2018).

The estimated burden of typhoid fever in Africa is 762 per 100000 person-years. This review applied a modeling approach that included factors such as population density, growth in domestic production, and sanitation as predictors of disease burden (Antillon et al, 2017). The MoH of Uganda notified the WHO of the typhoid fever outbreak, which started in Kampala city at the beginning of 2015. As of March 2015, a total of 1940 suspected cases had been reported from the first epicenter in downtown Kampala; the outbreak has now spread to all divisions in the capital city and other districts within the country (WHO, 2018). This study assessed knowledge, attitude, and practices towards typhoid fever prevention among patients aged 18-45 years, Kajjansi Health Centre IV, Wakiso district.

Methodology

Study Design

Study design is a framework of the methods and procedures used to collect and analyze data on variables specified in a particular research problem. In this research, a descriptive cross-sectional study was used.

Study Area

A study area is a site or setting where research is to be carried out. This study was carried out at Kajjansi Health Centre IV, Wakiso District, 14 kilometers from Kampala along Entebbe Road, which is easily accessible to the researcher, and the researcher can access the patients.

Study Population

The study population refers to the subset of the target population available for the study. In this study, the study population was patients aged between 18-45 years, both males and females, at Kajjansi Health Centre IV, Wakiso District.

Sample Size Determination

Sample size determination refers to the process of choosing the right number of people from a larger group to be used as a sample.

Sample size was calculated using QR/T (Burton, 1995) Where;

Q= Total number of days spent in data collection R= Maximum respondents per day

T= Maximum time taken by the interviewer Therefore;

R=3 respondents Q= 5days

T= 1/2 hours

QR/T= 5x3/1/2 = 30 respondents

Therefore, the sample size for this study was 30 respondents.

Sampling Technique

Sampling technique refers to the criteria used to select respondents for the study. In this study, a simple random sampling technique was used to select respondents. This sampling technique was preferred because the researcher was able to select a sample size that had an unbiased representation of the population.

Data Collection Method

Questioning Method

The questionnaire method was used as a research instrument to collect the primary data. It involved several questions cutting through individual, community, and health facilities. The questionnaire method was used.

Interviewing method

In the interview method of data collection, a researcher directly communicates with the interviewee/respondent and tries to get information that he or she records by himself/herself. This method assumes that the respondent has the information and that he is willing to give honest answers while the researcher is present. Both open-ended and closed-ended questions were employed to generate the needed data. The interviewing method was used because it can be used even for illiterate respondents.

Data Collection Tools

Questionnaire

A questionnaire is the data collection tool that was used in the study. It is a set of written or printed questions with a choice of answers devised for a survey or statistical study. In this study, structured questionnaires with both open-ended and closed-ended questions on the basis of a literature review were used.

Interview guide

This consists of closed and open-ended questions, which have a general plan for the interview that the interviewer follows to obtain the necessary information. It's more advantageous than the questionnaire in that the questions are more probing than those in the interview schedule. This allows the interviewer to get deeper information.

Document Review Guide

A document review guide helps researchers systematically evaluate and extract relevant information from documents to answer their research questions. It helped to provide a structured approach for reviewing and analyzing documents as well as consistency and reliability in data collection.

Data Collection Procedure

An introduction was made by the researcher himself to the ward in charge, who later identified patients infected with typhoid fever who were involved in the study. Written consent was obtained from respondents before being given

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a questionnaire, and they were directed on how to fill it out clearly by the researcher to ensure it was not misused. Then the questionnaires were handed to respondents to get the data.

Study Variables

Variables are characteristics or observations that take different values in time and place. This research aimed at determining the knowledge, attitude, and practices towards typhoid fever prevention among patients aged 18-45 years. Therefore, according to the study, knowledge, attitude, and practices were the independent variables, whereas typhoid fever prevention was the dependent variable.

Quality Control

In order to ensure the collection of quality data, the research tools were pretested on 5 patients, and research assistants were trained and pretested on 5 patients. In addition, a pilot study was conducted to test the reliability of the questions and the time needed to interview each patient, including research assistants. The tools were given to the supervisor from Kampala School of Health Sciences to ascertain their validity. After piloting, the results were modified to improve clarity before undertaking the study. Time required for the research was later determined from the ample time taken in the pilot study. All patients aged 18-45 years, residents of Wakiso District who received health services at Kajjansi Health Centre IV were eligible to be included in the study, and all patients who were neither residents of Wakiso District nor received health services from Kajjansi Health Centre IV were excluded from the study. All standard operating procedures were followed by the researcher and the research assistants, and they were to wear face masks as well as carry hand sanitizers.

Data Analysis and Presentation

Data analysis was done through tallying, coding, and editing. Raw data was cleaned and entered into the computer using Microsoft spreadsheets for frequency distribution tables and charts. Data analysis was also based on the response to the questions. Results were presented using frequency distribution tables, pie charts, and bar graphs.

Results

Socio-demographic data

Table 1: Shows the socio-demographic data of the respondents.

Socio-demographic characteristic	**Number**	**Percentage (%)**
Age 18-24 25-31 32-38 39-45	 8 11 6 5	 28 34 20 18
Gender Male Female	 9 21	 30 70
Religion Muslim Pentecostal Protestant Catholic	 4 6 3 17	 12 16 8 56

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Highest level of Education No formal education	9	30
Secondary	7	24
Tertiary	6	20
	8	26

Employment		
Unemployed Peasant	6	20
Employed(formal) Self-employed	6	20
	3	10
	15	50

Knowledge of patient towards typhoid fever prevention

Figure 1: Shows the distribution of respondents whether they have ever heard about typhoid fever or not.

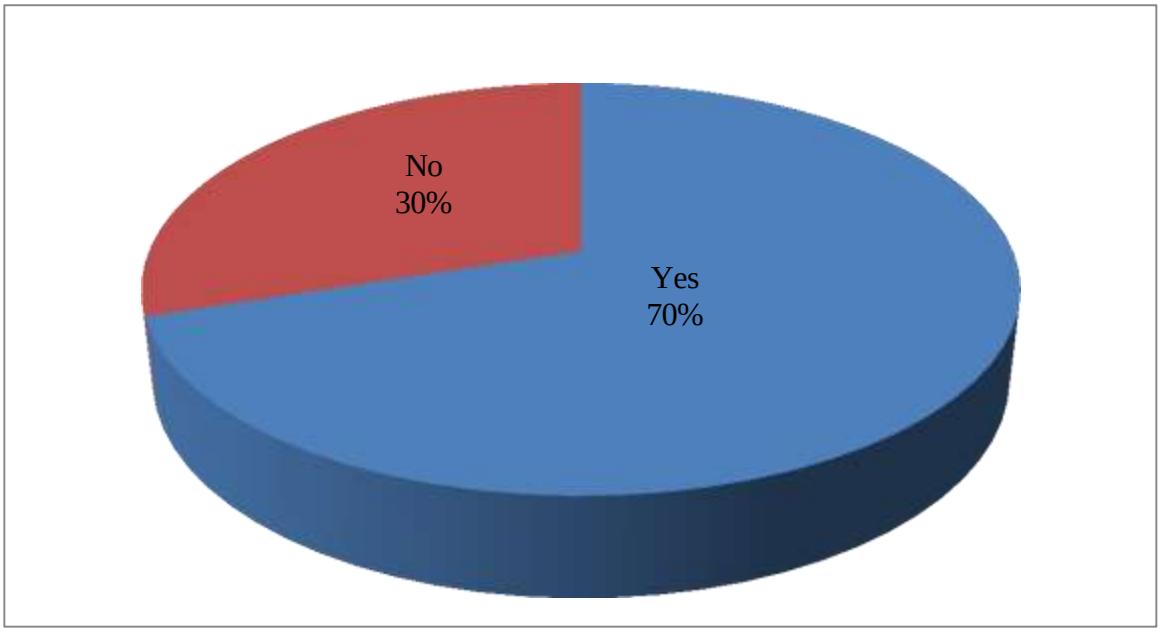

Figure 1 shows that a larger percentage of 70% of the respondents knew about typhoid fever, and a smaller percentage of 30% of the respondents did not know about typhoid fever.

Figure 2: Shows the distribution of respondents according to whether they knew how typhoid fever spreads.

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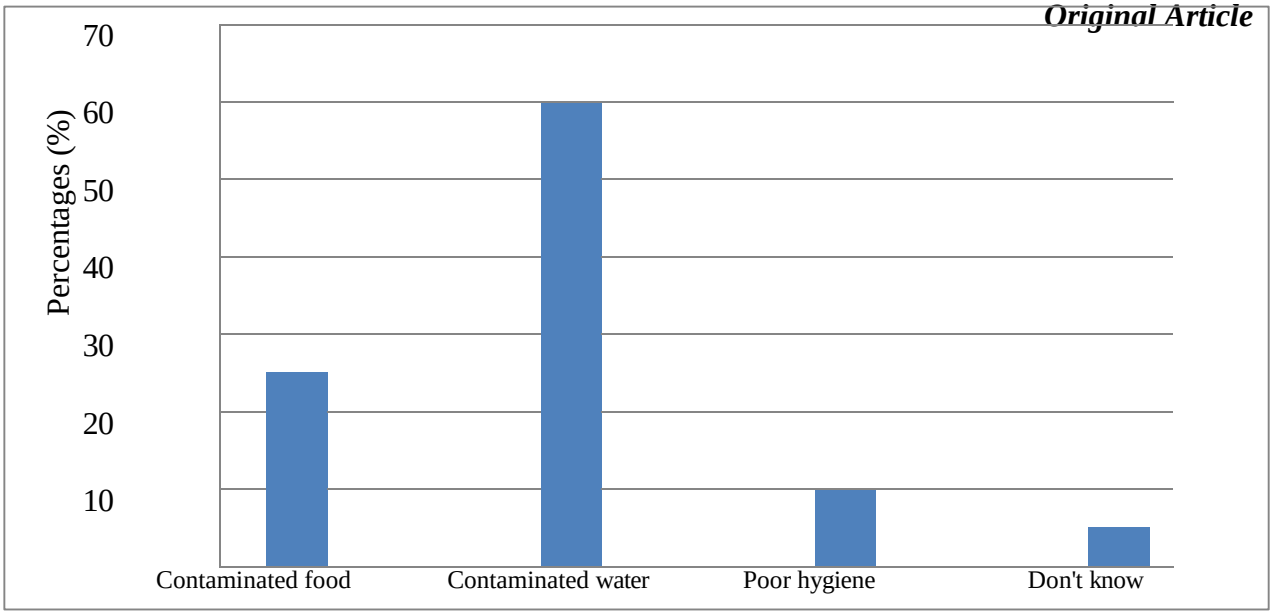

Figure 2 indicates that, it showed that a bigger percentage of respondents (60%) knew that Typhoid fever is spread through contaminated water; a big percentage of respondents (25%) knew that it is spread through contaminated food; a small percentage (10%) knew that it is spread through poor hygiene and a smaller percentage (5%) never knew how typhoid fever is spread.

Figure 3: Shows the distribution of the knowledge of the respondents on the common symptoms of typhoid fever.

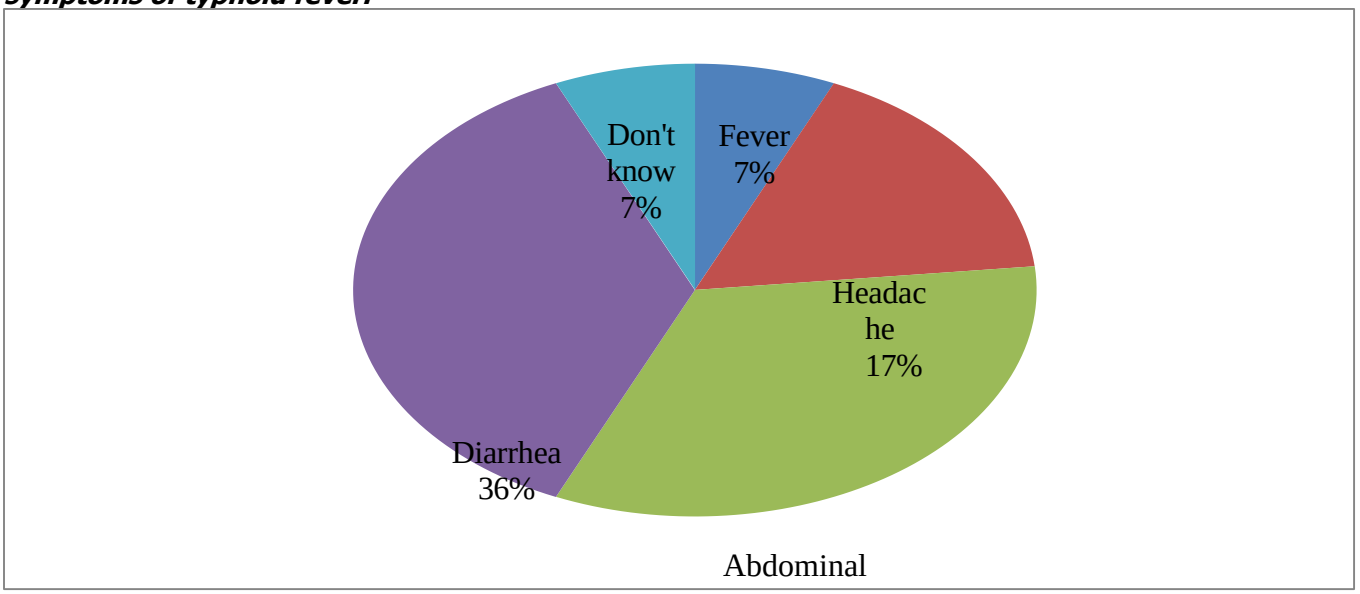

Figure 3 showed that most respondents (36%) knew that diarrhea was a symptom of typhoid fever, many respondents (33%) knew that abdominal pain was a symptom of typhoid fever, 17% of the respondents knew that headache was a sign of typhoid fever, 7% of the respondents knew that fever was a symptom of typhoid fever and 7% of the respondents never knew the common symptoms typhoid fever.

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Figure 4: Shows the distribution of respondents to whether they know that typhoid fever can be prevented.

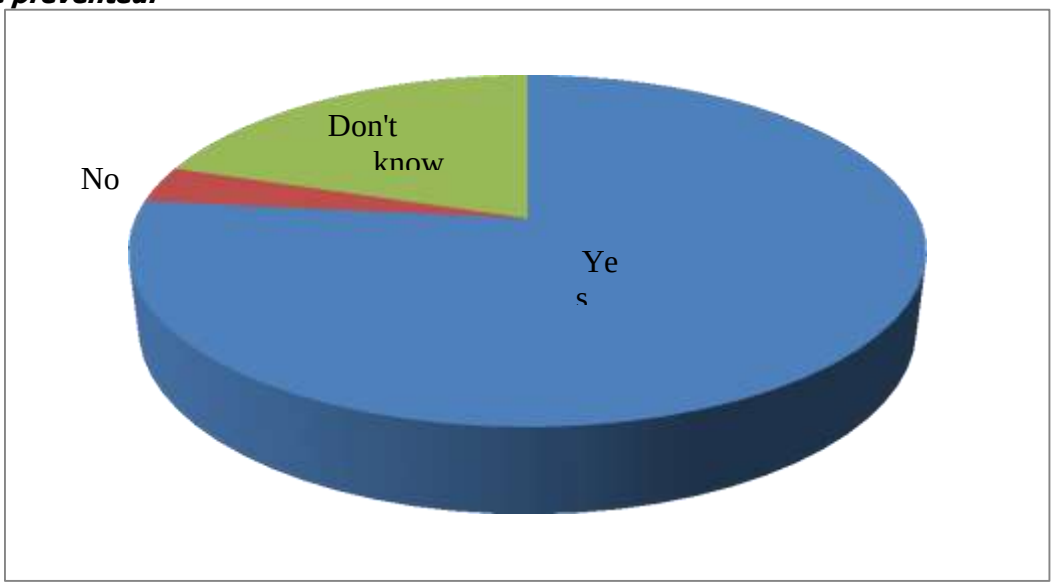

Figure 4 shows the percentage distribution of the respondents according to whether they know if typhoid fever can be prevented or not. It showed that 77% knew that typhoid fever can be prevented, 20% did not know if it can be prevented or not, and 3% knew that typhoid fever can never be prevented.

Attitude towards typhoid fever prevention

Figure 5: Shows the distribution of the respondent's thoughts towards typhoid fever prevention.

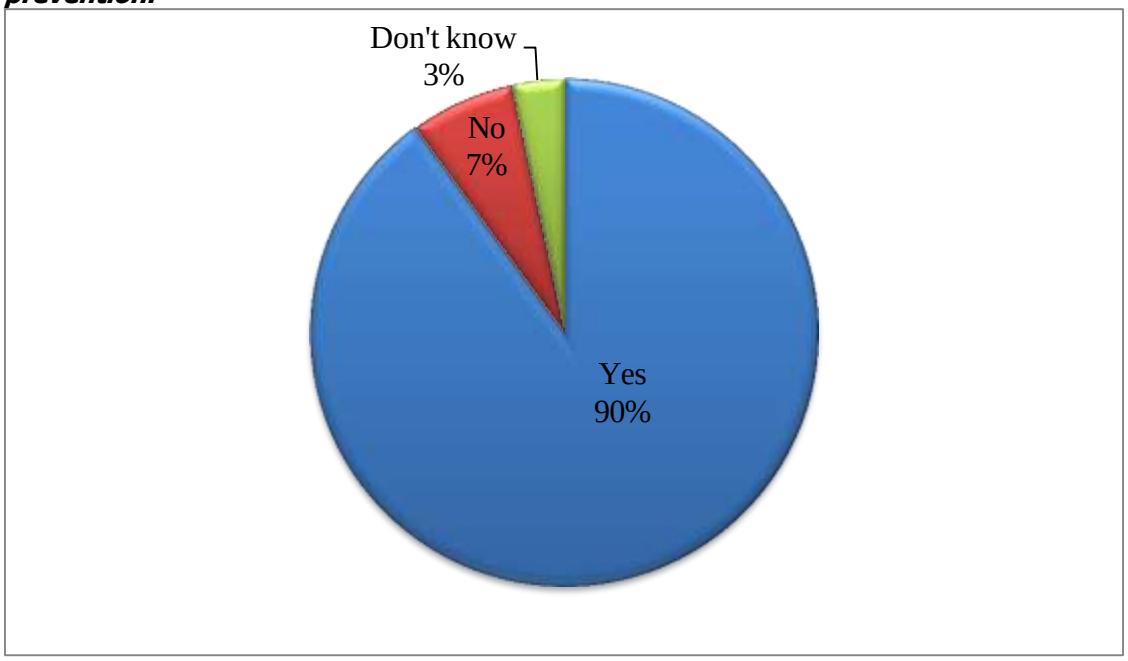

Figure 5 indicates that 90% thought it was important to prevent typhoid fever, 7% thought it was not important to prevent

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typhoid fever, and 3% never knew if it was important or not to prevent typhoid fever.

Table 2: Shows the distribution of respondents in accordance to where they seek information about typhoid fever prevention.

Where they seek information	**Number**	**Percentage (%)**
Healthcare workers	12	40
Community meetings	5	15
Mass media	7	25
Friends and family	4	15
Don't seek information	2	5
TOTAL	**32**	**100**

Table 2 shows that, in accordance to where they seek information about typhoid fever prevention and it showed in the study that majority (40%) of the respondents seek information from health workers, many (25%) seek from mass media, few (15%) seek from community meetings and friends and family and the least (5%) don't seek information at all.

Practices towards typhoid fever prevention

Figure 6: Shows the distribution of respondents to whether they wash hands with soap before eating or not.

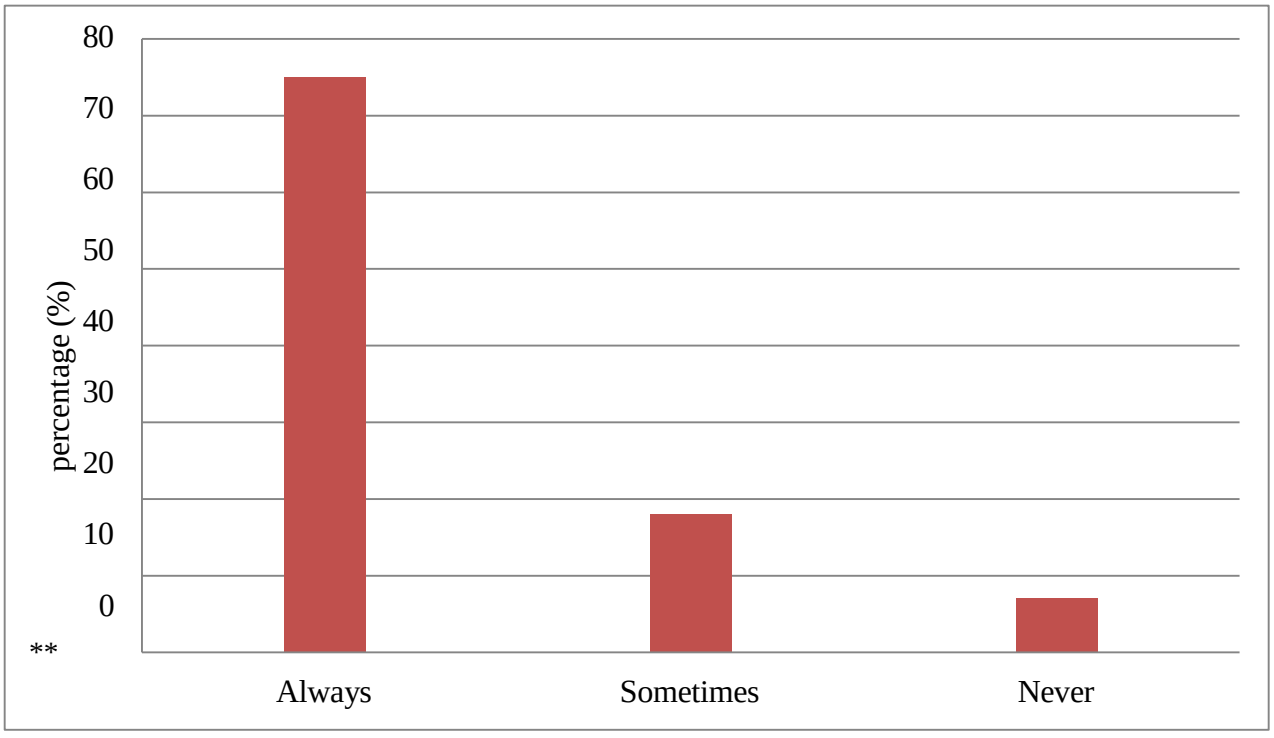

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Figure 6 shows that 75% of them always wash their hands, 18% sometimes wash their hands before eating, and 7% never wash their hands before eating.

Figure 7: Shows the distribution of how often respondents drink boiled or treated water.

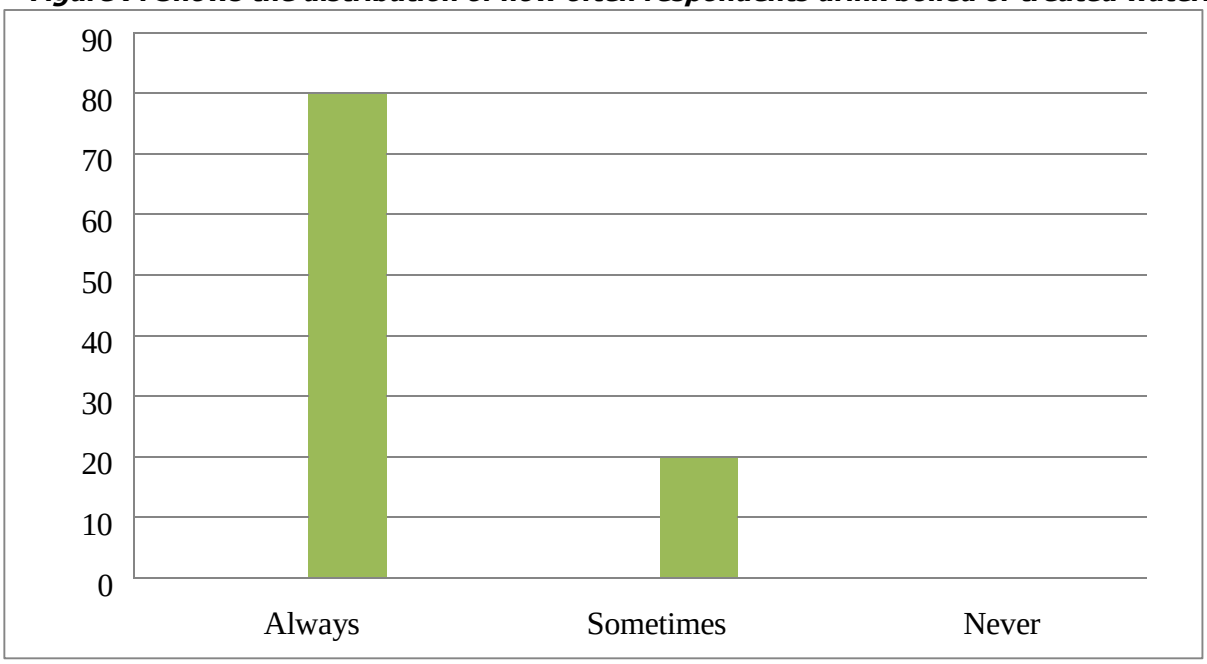

Figure 7 showed that 80% always drink boiled water, 20% drink boiled water sometimes, and 0% never drink boiled water.

Figure 8: Shows the distribution of respondents according to where they seek treatment if they suspected typhoid fever.

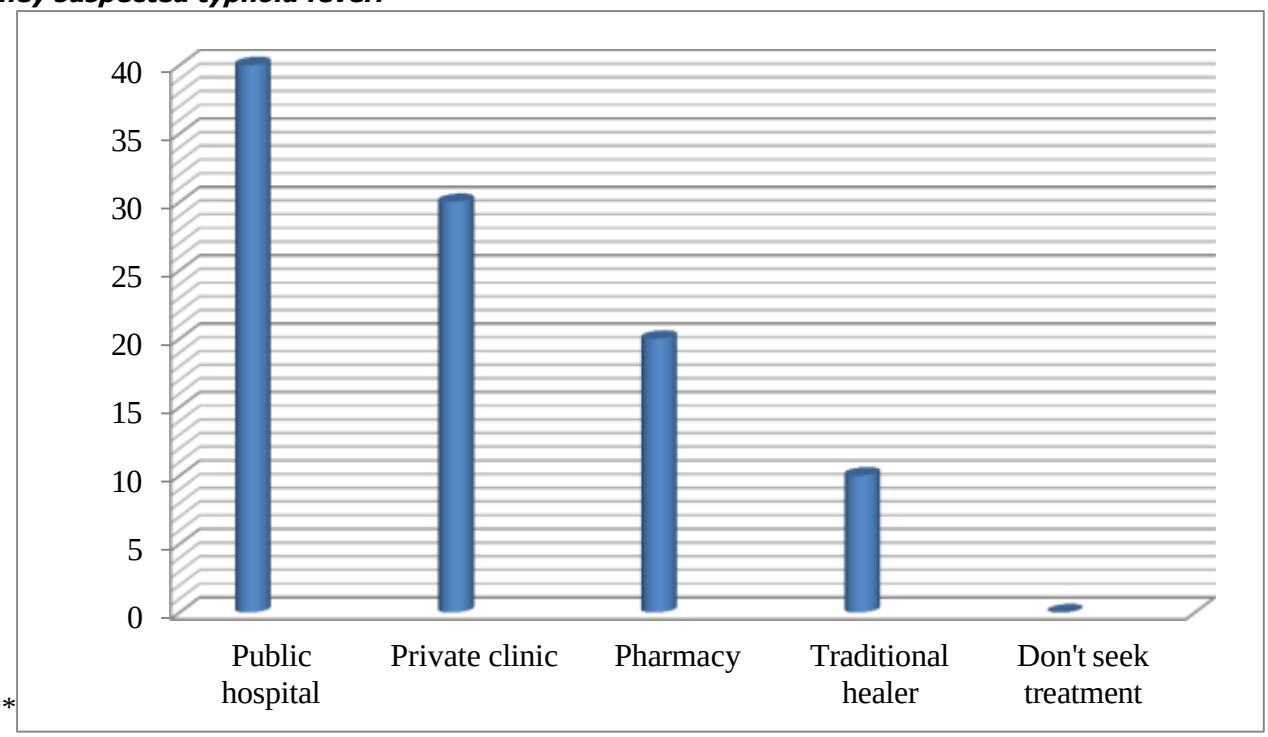

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Figure 8 shows the percentage distribution of respondents according to where they seek treatment if they suspect typhoid fever, and 40% get treatment from public hospitals, 30% from private clinics, 20% from pharmacies, 10% from traditional healers, where they get herbal medicines, and 0% don't seek treatment at all.

Discussion

Knowledge of patients towards typhoid fever prevention among patients aged 18-45 years

The objective of the study was to evaluate respondents' knowledge about typhoid fever, focusing on their understanding of its transmission, prevention, and symptoms. Data analysis revealed that 70% of respondents were aware of typhoid fever, indicating a high level of awareness. This finding aligns with a study conducted in Ethiopia by Getachew et al. (2021), where 52.8% of participants reported having heard of typhoid fever. The results suggest that awareness campaigns and education efforts in the study area may have effectively reached the population. In terms of transmission, 60% of respondents identified drinking contaminated water as a primary mode of contracting typhoid fever. This contrasts with findings by Anyidi (2023) in Uganda's Adjunani District, where only 35% of respondents recognized drinking unboiled water as a risk factor. These variations could stem from differences in public health messaging or community knowledge across regions. Addressing this gap in knowledge might require tailored health education campaigns to provide clearer and more uniform information about typhoid fever transmission. The study also found that 77% of respondents were aware that typhoid fever can be prevented, indicating a strong understanding of preventive measures within the community. Additionally, 66% of respondents identified diarrhea as a common symptom of typhoid fever, showcasing significant awareness of its clinical presentation. This highlights the success of public health initiatives in promoting knowledge about prevention and symptoms. However, further emphasis on the importance of preventive practices, such as boiling water, may help reinforce knowledge on prevention strategies.

These findings suggest that most respondents possess substantial knowledge about typhoid fever, particularly regarding prevention and symptoms, though there are gaps in understanding its transmission. This aligns with Getachew et al. (2021) regarding general awareness but differs from Anyidi (2023) on transmission knowledge, indicating regional disparities in understanding risk factors. Theoretical implications emphasize the need for region-specific health education strategies that account for local contexts to enhance comprehensive knowledge about typhoid fever.

Attitude of the patients towards typhoid fever prevention among patients aged 18-45 years

The objective of the study was to assess respondents' attitudes toward typhoid fever prevention and their health-seeking behaviors. The findings revealed that 90% of the respondents had a positive attitude, considering it important to prevent typhoid fever. This is consistent with Anyidi (2023) in Adjumani District, where 60% of respondents demonstrated similar positive attitudes. These results highlight the effectiveness of public health education in promoting proactive attitudes toward disease prevention in the study area. The study also showed that 40% of respondents sought information about typhoid fever prevention from healthcare workers. This aligns with findings by Mana Rosette et al. (2017) in Rwanda, where 96% of respondents sought medical assistance, and 95.8% relied on orthodox healthcare sources. While this indicates a generally positive health-seeking behavior, the lower percentage in the current study compared to Rwanda suggests potential gaps in access to or awareness of healthcare services in the study area.

Practices of patients towards typhoid fever prevention among patients aged 18-45 years

The objective of the study was to assess respondents' preventive practices against typhoid fever, focusing on hygiene, water safety, and health-seeking behaviors. The findings revealed that 75% of respondents always washed their hands with soap before eating, a positive practice in typhoid fever prevention. However, this contrasts with the study conducted by Anyidi (2023), where 56% of respondents viewed handwashing with soap as a major preventive practice. This disparity may indicate differing levels of emphasis on hygiene education across the two study areas. The study also found that 80% of respondents always drank boiled water, another key practice in preventing typhoid fever. This is consistent with Anyidi (2023), where 75.7% of respondents reported drinking boiled water as a primary preventive measure. Additionally, 40% of respondents sought information

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about typhoid fever prevention from public hospitals, which aligns with findings from Maria Rosette et al. (2017) in Rwanda. In the Rwandan study, 96% of respondents sought medical assistance, with 95.8% relying on orthodox healthcare sources, demonstrating similar trust in formal healthcare systems.

Conclusion

Regarding the knowledge of the prevention of typhoid fever among patients aged 18-45 years, most (70%) of the respondents were aware of typhoid fever, and most (60%) of the respondents knew that it spreads through drinking contaminated water. The majority (77%) of respondents knew that typhoid fever can be prevented, and most (36%) had knowledge of the symptoms of typhoid fever and knew that diarrhea is a common symptom. These findings suggest that most respondents possess substantial knowledge about typhoid fever, particularly regarding prevention and symptoms, though there are gaps in understanding its transmission. Based on attitude towards the prevention of typhoid fever, most (90%) had a positive attitude towards typhoid fever prevention, and the majority (40%) showed a positive attitude in seeking information about typhoid fever prevention from health workers. These findings suggest that respondents generally value typhoid fever prevention and trust healthcare workers for guidance, though there is room for improvement in health-seeking behaviors. Regarding the overall practices towards typhoid fever prevention, the study discovered that most (75%) of the respondents always washed their hands with soap before eating which a good preventive practice, most (80%) of the respondents always drink boiled water and the majority (40%) of the respondents seek information about typhoid fever prevention from public hospitals. These findings suggest that respondents generally engage in effective preventive practices, particularly hand-washing and drinking boiled water, though the extent of these practices varies across regions. Health-seeking behavior, such as consulting public hospitals, also reflects trust in healthcare systems as sources of accurate information.

Therefore, in conclusion, the knowledge, attitude, and practices of the respondents towards typhoid fever prevention among patients aged 15-45 years at Kajjansi Health Centre IV, Wakiso District were generally good during the study.

Limitation of the study

Inadequate finance since no external source of funds was provided for the study. Hostile respondents affected the study negatively. Language barrier since patients came from different regions of the country and were residents of the study area. Limited time since some respondents never had enough to fill the whole questionnaire.

Recommendations

The government of Uganda, through the Ministry of Health, should recruit more health inspectors who will help in the sensitization of the community about typhoid fever in case of its outbreak. The town council should actively strategize with the street vendors who sell food and drinks to emulate good waste disposal practices to prevent outbreaks of typhoid fever. The District Health Team, through the health workers, should promote community health-based programs to teach the community the best practices to curb the increasing typhoid fever. The infectious disease control and prevention (IDC) should continue to initiate community awareness about the outbreak and its control and prevention. The government of Uganda, through the Ministry of Health, together with the related NGOs, should put up studies that provide information about the prevention of typhoid fever to the communities.

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List of abbreviations

CDC: Center for Disease Control

IDC: Infectious Disease Control

NGO: Non-Government Organization

MoH: Ministry of Health

UAHEB: Uganda Allied Health Examination Board

WHO: World Health Organization

Source of funding

There is no source of funding.

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Conflict of interest
No conflict of interest declared.

Availability of data
Data used in this study is available upon request from the corresponding author.

Author's contribution
HL designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and GO supervised all stages of the study from conceptualization of the topic to manuscript writing.

Ethical approval
A letter of introduction was obtained from the Kampala School of Health Sciences research committee, introducing the researcher and seeking permission to carry out the study with assurance of confidentiality. The study was started after the objectives of the study were explained to participants, and they consented to participate in the study. Any information obtained from the respondents was kept confidential, and questionnaires were stored in a lockable case that was not easily accessed.

Informed consent
The purpose of the study was explained to the participants and only those who consented were included in the study. Confidentiality, privacy and anonymity were maintained throughout the study.

Author's biography
Hudu Lubowa is a student of diploma in clinical medicine and community health at Kampala School of Health Sciences
Glorious Orishaba is a research supervisor at Kampala School of Health Sciences.

References
1) Chrisatus Anyidi, Vicent Charles Kalungi. (2023). KNOWLEDGE, ATTITUDE AND PRACTICES TOWARDS TYPHOID FEVER PREVENTION AMONG PATIENTS AGED 15- 50 YEARS, ADJUMANI GENERAL HOSPITAL, ADJUMANI WAKISO. South Sudanese

2) Journal of Health Research Africa, 4(9),13. DOI: https://doi.org/1051168/sjhrafrica.v4i9,528

3) James Kasadha, Stephen Oketcho. (2022). Factors Contributing to increased cases of Typhoid Fever among patients aged 18-45 years in Kakira Health Centre III, Jinja District. A Descriptive Study. South Sudanese Journal of Health Research Africa.

4) Melese Workneh Fego and Engedawerk Tilahun. "Typhoid Fever Prevention Knowledge, Attitude and Practices Among Food Handlers in Mettu University Students' Cafeteria, Southwest Ethiopia, 2022: Mixed Method." American Journal of Nursing and Health Sciences, 4(2), 35-42

5) Yeko Soyekwo. (2023). "Typhoid Fever Prevalence and Risk Factors in Patients at Kapchorwa Hospital in Eastern Uganda" Kiu Publication Extension, 9(3):129-141. DOI: 10.59298/IDOSR/JES/111.1.101010

6) Detaches, D., Wale, B., Eshete, W., Getahun, B., Demise, W., Shewasinad, S., & Deres,

7) T. (2018). Assessment of knowledge and risk perception towards typhoid fever among communities in Mendida Town, Ethiopia. EC Pediatrics, 7(3), 70-78. Retrieved from https://eronicon.net/assets/ecpe/pdf/ECPE-07-00370.pdf

8) Mulu, W., et al. (2021). Seroconfirmed typhoid fever and knowledge, attitude and practices among febrile patients attending at Injibara General Hospital, Northwest Ethiopia. Journal of Infection in Developing Countries, 15(5), 628-636. DOI: 103855/jidc.13925

9) Antillon, Warren, Grawford, Weinberger. (2017). The burden of typhoid fever in low and middle income countries; Ametaregression approach. Plow one, 33-35.

10) CDC. (2020). Ingestion of contaminated foods, water and beverages among venders in Kigezi, Kabale and Kisoro districts. Biomed central, 83.

11) Chalachew, Ababu, Getachew, Tesfaye. (2021). Seroconfirmed typhoid fever and knowledge, attitude and practices among patients attending at Injibara General Hospital, Northwest of Ethiopia. Biomed-res-international, 113.

12) Keith, Silverberg, Schneider. (2018). Preventing food borne illnesses; typhoid fever salmonella typhi. Askifas EDIS, 44.

**

13) Mogasle. (2014). Burden of typhoid fever in low income and income countries; a systematic literature-based update with risk factor adjustment. Lancet Glob health, 12.

14) Olushayo. (2021). Monitoring the ongoing typhoid fever control measures in Mahama refugee camp in Rwanda. WHO journalmed, 37.

15) WHO. 2018). Home disease outbreak news. WHO international journals, 334.

16) Afolaranmi, T., Hassan, Z., & Bello, D. (2015). Knowledge and practice of food safety and hygiene among food vendors in primary schools in Jos, Plateau State, North Central Nigeria. Journal of Medical Research, 4(2), 16–22.

17) Akabanda, F., Hlortsi, E., & Owusu-Kwarteng, J. (2017). Food safety knowledge, attitudes, and practices of institutional food handlers in Ghana. BMC Public Health, 17(1), 40.

18) Al Reesi, M., Stephens, G., & McMullan, B. (2016). Severe thrombocytopenia in a child with typhoid fever: A case report. Journal of Medical Case Reports, 10(1), 333.

19) Ali, M., Yahaya, A., Nas, F., Anas, A., & Ibrahim, I. (2017). Trends in treatment and vaccine development of typhoid fever: A review. Asian Journal of Biotechnology and Bioresource Technology, 2(4), 1–7.

20) Bull, F., Rathore, M., & Maraqa, N. (2015). Salmonella infections in childhood. Advances in Pediatrics, 62, 29–58.

21) Callan, M., Kim, H., Gheorghiu, A., & Matthews, W. (2017). The interrelations between social class, personal relative deprivation, and prosociality. Social Psychological and Personality Science, 8(6), 660–669.

22) Casmir, I., Bassey, E., Nkiruka, F., & Nazek, A. (2014). Molecular characterization and antibiotic resistance of Salmonella in children with acute gastroenteritis in Abuja, Nigeria. Journal of Infectious Diseases in Developing Countries, 8(6), 712–719.

23) Center for Disease Control and Prevention (CDC). (2018). Typhoid fever information for health professionals. Retrieved May 25, 2018.

24) Crump, J., & Kirk, M. (2019). Progress in typhoid fever epidemiology. Clinical Infectious Diseases, 68(Suppl. 9), 45.

25) Dewan, A., Corner, R., Hashizume, M., & Ongee, E. (2013). Typhoid fever and its association with environmental factors in the Dhaka metropolitan area of Bangladesh: A spatial and time-series approach. Environmental Health, 7(2), 1–18.

26) Assuit Health Affairs Directorate. (2019). Retrieved from http://www.assuit-health- affairs-directorate.

27) Galán, J. (2016). Typhoid toxin provides a window into typhoid fever and the biology of Salmonella Typhi. Proceedings of the National Academy of Sciences, 113(23), 6338–6344.

28) Global Burden of Disease (GBD). (2015). Mortality and causes of death, collaborators. (2016). Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 2015: A systematic analysis for the Global Burden of Disease Study 2015. The Lancet, 388(10053), 1459–1544.

29) Jabar, R., & Sadeq, T. (2017). Knowledge, attitude, and practice of mothers towards typhoid fever disease. Iraqi Journal of Medical Sciences, 15(1), 71–77.

30) Jenkins, R. S., Hendriksen, M. L., Mikoleit, K. H., Keddy, R., & Ochiai, L. (2019). Typhoid fever. The Lancet Infectious Diseases, 385, 1136–1145.

31) Kariuki, S., Gordon, M., Feasey, N., & Parry, C. (2015). Antimicrobial resistance and management of invasive Salmonella disease. Vaccine, 33(Suppl. 3), C21–C29.

32) Mogasale, V., Maskery, B., & Ochiai, R. (2014). Burden of typhoid fever in low-income and middle-income countries: A systematic,

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literature-based update with risk-factor adjustment. The Lancet Global Health, 2, 570–580.

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