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HELICOBACTER PYLORI INFECTION AMONG PATIENTS ATTENDING OUTPATIENT DEPARTMENT AT BUMANYA HCIV, KALIRO DISTRICT. A CROSS-SECTIONAL STUDY.

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ABSTRACT.

Background:
A review of medical records in Bumanya revealed a large number of patients presenting with *H. pylori* infection-related complaints such as heartburn, bloating, gastric pain, loss of appetite, and nausea among others. Therefore, the study aimed to determine the prevalence of Helicobacter pylori infection and associated factors among patients attending the Outpatient Department at Bumanya Health Centre IV, Kaliro district.

Methodology:
The study was a hospital-based cross-sectional study that targeted all patients present at the outpatient unit in Bumanya Health Centre IV, Kaliro district from June 2023 to July 2023. A total number of 90 participants was considered for the study and data was analyzed using Microsoft Excel.

Results:
There is a low prevalence (29%) of H. Pylori in patients attending the Outpatient Department. Out of the 90 respondents, 52(57.8%) were female and (42.2%) were male. 26(29%) tested positive for H.pylori whereas 64 (71%) were negative. The issue of factors associated with H.pylori, washing hands before preparing food was being practiced at a low rate, 77% got infections through not washing their hands when going to prepare food and only 23% washed their hands. Washing hands after using the latrine was practiced at a high rate with 73% who washed hands after using the latrine and 27% not. 50% had primary level as their highest level of education and the highest positive H. pylori infection, participants that had no education background with 15% and followed by the least numbers from tertiary noted by 12%

Conclusion:
Among the factors exposing patients to H. Pylori were poor hygiene, low level of education, and high level of unemployment.

Recommendation:
There is a need for more sensitization and education of people about H. Pylori disease such that the numbers do not go high.

Keywords; *Helicobacter pylori infection, Outpatient Department, Bumanya Health Centre IV, Kaliro district*
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BACKGROUND OF THE STUDY.

Helicobacter pylori formerly known as *Campylobacter pylori* are Gram-negative curved micro-aerophilic and motile organisms ("Helicobacter Pylori Antigens," n.d.). It colonizes and grows in human epithelial tissue and mucus membranes. It is a common bacterium infecting about half of the world's population (Warren JR *et al*., 1983*). H. pylori* was identified in 1984 (Marshall *et al.*,1984) and further it was classified as being carcinogenic to humans by the Internal Agency for Research on cancers in the next ten years. World Health Organization considers. *H. Pylori* is a carcinogen (Kuster et *al*., 2006).

The infections are thought to occur early in life during childhood and the infection implicates several medical conditions including chronic gastritis, gastric cancer, gastric adenocarcinoma, mucosa-associated lymphoid tissue (MALT)lymphoma, and peptic ulcer disease (Aitila, P et al., (2019). Acquisition at an older age brings different gastric changes more likely to lead to duodenal ulcers (Brown,2000). Once acquired infection generally persists throughout life unless treated by specific antimicrobial therapy.

H. pylori infection is a global public health problem affecting over 50% of the population Worldwide (Aitila et al., 2019). In Europe the lowest prevalence was found in Northern Europe, *H. pylori* while the highest prevalence was

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in Eastern and Southern Europe up to 84% in Portugal and Poland (Olga *et al.*, 2018). In industrial countries, almost 50% of adults are infected although its prevalence seems to be decreasing (Wang HC, 2015).

In Africa, the prevalence *of H. pylori* reaches 80% or more among adults (Smith *et al*., 2018). In East Africa, a study from Kenya, among patients who presented with dyspepsia, showed a prevalence(Smith et al., 2019) of *H. pylori* infection of 73.3% in children and 54.8% in adults(Smith et al., 2019). In rural Uganda, the prevalence of *H. pylori* was established as 29.9 % (Tsongo*et al*., 2015), and a
few studies have been reported in Kampala with an overall prevalence of 43.3% among children in a community-based cross-section survey (Hestvik*et al*., 2010).
The mode of transmission of *H. pylori* is not certainly known, however, epidemiological studies strongly support, person-to-person transmission, and fecal-oral and oral-oral routes(Aitila et al., 2019). Several factors control the transmission in developing countries including, low socio-economic status, poor quality of drinking water, overcrowding, poor personal hygiene and environmental hygiene, and food contamination (Tsongo *et al*., 2015).
H. pylori testing involves both invasive methods like endoscopy with biopsy and non-invasive methods like serology. Stool antigen and urea breath tests are viable for the diagnosis of *H. pylori* infection in children. Ideally, a diagnostic test for *H. pylori* should be non-invasive, highly sensitive and specific, inexpensive, and easy to perform. Because *H. pylori* and its macromolecules such as proteins and DNA are shed in feces, stool-based tests have become acceptable techniques for the diagnosis of non-invasive infection (Cisneros *et al.*, 2007). A stool culture for isolation of *H. pylori* bacteria can also be done. This leaves stool *H. pylori DNA* and Antigen detection as more suitable diagnostic tests. Several enzyme-linked immunosorbent assays (ELISA) tests are available. Some use polyclonal anti-H. pyloricapture antibody while others use monoclonal antibodies (Antos, D.Crone J *et al*.,2005), (Hauser B *et a*l., 2006).
In Kaliro district hospital, there was no available published information on the prevalence of *H. pylori* infection among children and adults. The primary objective of my study was to determine the prevalence of *H. pylori* infection and associated factors among patients attending OPD at Bumanya HCIV in Kaliro district.
The objective of the study was to determine the prevalence of Helicobacter pylori infection and associated factors among patients attending OPD at Bumanya HCIV, Kaliro.

METHODOLOGY.

Study design.

The study was a hospital-based cross-sectional study.

Study population.

The study targeted all patients present at the outpatient unit in Bumanya HCIV, Kaliro district.

Study setting.

The study was carried out at Bumanya HCIV, located in Kaliro district, Busoga in the Eastern region of Uganda from June 2023 to July 2023. It is situated approximately 7Km from Kaliro town and 48.2 Km from Iganga district which is the nearest big town. The location coordinates are 100’6” N(latitude) and 33029’42’E (longitude).

Sample size determination.

Using the Kish and Leslie's standard formula (1965):

$$N = \frac{Z^2 P q}{d^2}$$

Where
N=Sample size.
Z standard normal variation corresponds to a 95% confidence interval which is 1.96. P= estimated prevalence of *H. pylori* in Uganda =37.4% (Lawrence Tsongo et al., 2015). q= 1-p.
d= allowed error/degree of accuracy (10%) = 0.1.

$$N = \frac{(1.96)^2(0.374)(0.626)}{(0.1)^2}$$

N= 90 participants.

Sampling technique.

A simple random technique was used to obtain the participants to be involved in the study. All participants had equal chances to be selected as long as they met the requirements as per inclusion criteria.

Sampling procedure.

All patients attending the OPD unit at Bumanya HCIV per day were required to provide their name, age, and sex. In addition, the patients were given unique identification numbers. The participants were provided with stool containers and instructed on how to collect the stool sample as required by the study regarding Health Standard Operating Procedures (SOPs) and the laboratory for

analysis and the sample's date received was recorded. Only sufficient samples had to be diagnosed. This was done daily until the desired sample size was reached.

Eligibility criteria Inclusion criteria.

All patients who consented and provided sufficient fresh stool samples were included in the study.

Study variables.

Independent study variables.

Associated factors such as sex, time of collection of samples, address, economic status

Dependent variables.

Prevalence of *H. pylori* among patients attending OPD in Bumanya HC IV, kaliro district

Data collection method.

An introductory letter was obtained from the St. Francis School of Health Sciences and presented to the hospital administration to obtain permission to carry out research. Participants were selected based on the inclusion and exclusion criteria and requested to consent freely. A semi-structured questionnaire was administered to participants who met the inclusion criteria and guided to fill in English
Each participant was then provided with a labeled stool container and instructed on how to collect an appropriate fresh sample for an *H. pylori* stool antigen test in the laboratory. In the laboratory, the stool samples were analyzed using the *H. pylori* stool antigen test kits available that determined if the participant had an active Helicobacter pylori infection

Data collection tools.

The instrument will include laboratory request forms and semi-structured questionnaires that will have closed-ended questions.

Data collection procedure.

Written consents were obtained from subjects and parents/caretakers for children who met the eligibility criteria during the study procedure that had been explained to them. Recruitment of the study subjects was by consecutive sampling with those whose stool antigen tests were positive as cases and those whose stool antigen tests were negative as controls.

Piloting to study.

A pilot study was conducted before the study which tested the validity and the reliability of the tools used in the study. The tools were subjected to the supervisor and laboratory to improve the tools and where applicable changes were made.

Quality control.

The results of the tests were compared with known positive and known negative control to achieve accuracy in the test results. The test kits were stored at recommended temperatures as per the manufacturer's instructions to avoid errors arising due to deterioration in potency. Also, the expiry date of the test kits was always checked before use.

Data analysis and presentation.

Data collected was entered into a computer database for management. The data was analyzed using Microsoft Excel. Data was summarized in frequency tables, charts & graphs.The prevalence of *H. pylori* was computed generally and accordingly to the different age groups.

Ethical consideration.

Ethical clearance was obtained from the St. Francis School of Health Sciences Ethical Committee and, an introductory letter by Principal Bumanya HCIV. Informed consents were obtained from adult study subjects and parents/caretakers for children below 12 years. Confidentiality was observed and unauthorized persons weren't allowed to access the data collected.
The data was kept by the principal investigator under lock and key. Each study subject was assigned a study identification number, and these subject identifiers weren't released outside the research group. Data was only accessed by the research group.
Responders were informed that their data was to be used anonymously. Subjects who tested positive were informed and referred to the Gastroenterology clinic where they were evaluated for treatment.

RESULT PRESENTATION AND ANALYSIS.

Socio-demographic factors of the participants.

The study recruited a total number of 90 participants who were attending the outpatient department at Bumanya Health Center IV. All the participants turned up for the study, giving a 100 % turn-up rate. The Socio-demographic factors of the participants are summarized in Table 1.

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Table 1: Table showing the socio-demographic information of the participants involved in the study.

Variables	Parameter	Frequency	Percentage (%)
Sex	Male	38	42.2
	Female	52	57.8
Age	0-10	5	5
	11-17	26	28
	18-35	32	35
	Above 35	27	30
Marital status	Singles	29	32.2
	Married	32	35.6
	Separated	18	20
	Divorced	4	10
	Widow/widower	2	2.2
Number of family members	0-4	42	46.7
	5-8	36	40
	Above 9	12	13.3
The highest level of education obtained	None	7	7.8
	Primary	22	24.4
	Secondary	38	42.2
	Tertiary	23	25.6
Employment status	Not employed	39	43.3
	Causally employed	42	46.7
	Permanent	9	10
Monthly income	< 50000	15	16.7
	50000 - 150000	11	12.2
	160000 – 300000	35	38.9
	310000 – 500000	20	22.2
	Above 500000	9	10
Washing hands when preparing food	Yes	28	31
	No	62	69
Washing hands after visiting latrines	Yes	81	90
	No	09	10

Out of the 90 participants sampled for the study, a majority, 52(57.8%) were female while the minority (42.2%) were male. The largest number of respondents (32%) were married while the fewest (2.2%) were either widows/widowers. Of the 90 participants, a majority (13.3%) were from families with more than 9 family members.

Prevalence of H. pylori infection among patients attending OPD in Bumanya HCIV, Kaliro.

Of the 90 patients attending the outpatient department at Bumanya Health Center IV who were involved in the research study, a minority, 26(29%) tested positive for H.pylori whereas a majority, 64 (71%) were negative as shown in figure 1.

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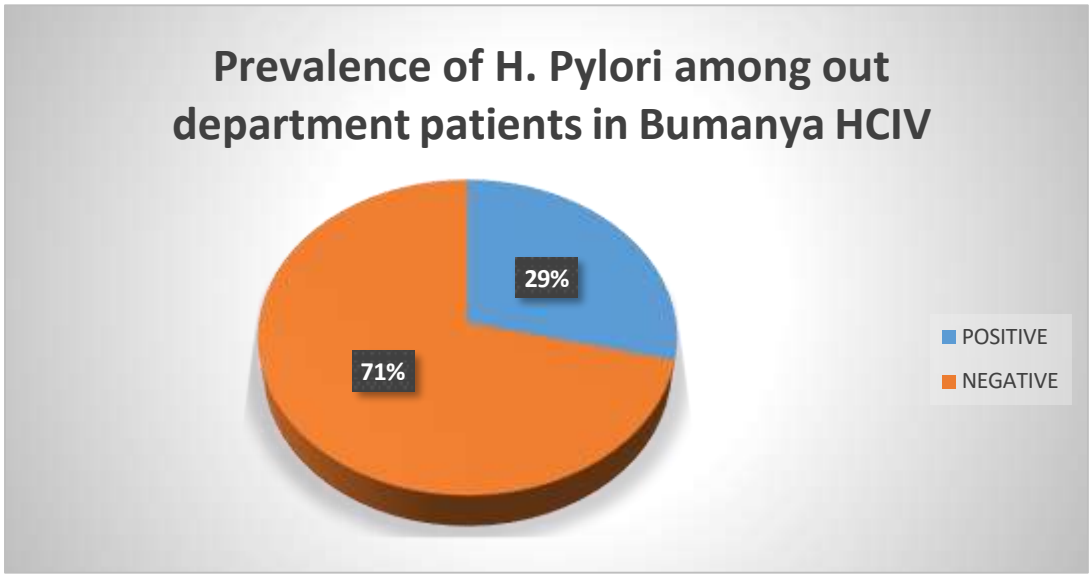
Figure 1: Prevalence of H. Pylori among OPD patients sampled.



The H. Pylori most affected age group among the participants.

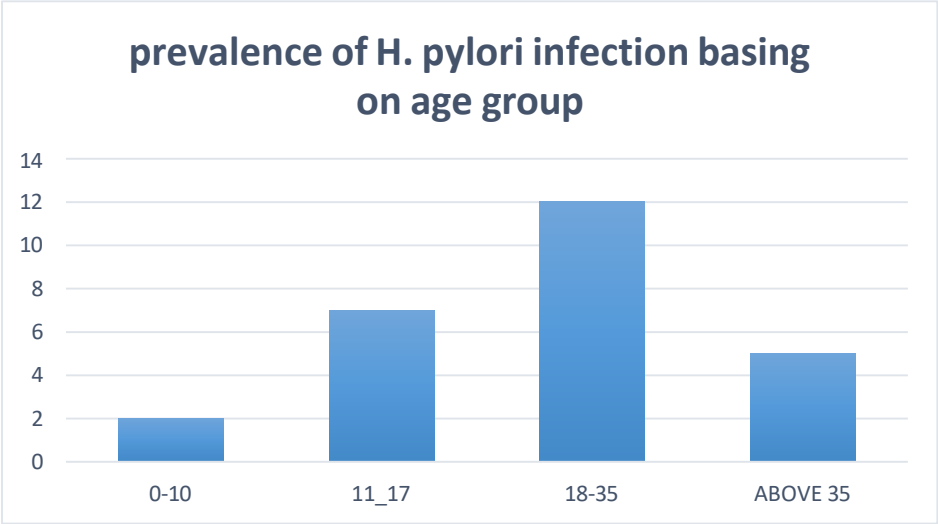


Figure 2: indicating the prevalence of H. pylori infection according to age groups.

Out of the 26 participants who tested positive for H.pylori, a majority, 12(46.2%) were between the age of 18-35 years while the least population, 2(7.6%) were aged 0-10 years as shown in Figure 2.

Prevalence of H. pylori among patients attending according to the different associated factors.

In Table 2, there are the demographic and socio-economic factors that are associated with the prevalence of H. Pylori in patients attending OPD in Bumanya HC IV in Kaliro district

Table 2: showing the prevalence of H. pylori infection among participants based on their socio-demographic factors.

Variables	Categories	Frequency	Frequency of Positive cases	Percentage of positives (n=26)
Marital status	Singles	29	13	50
	Married	32	7	27
	Separated	18	5	19
	Divorced	4	1	4
	Widow/widower	2	0	0
Number of family members	0-4	42	4	15
	5-8	36	11	42
	Above 9	12	11	42
The highest level of education obtained	None	7	4	15
	Primary	22	13	50
	Secondary	38	6	23
	Tertiary	23	3	12
Employment status	Not employed	39	15	58
	Causally employed	42	9	35
	Permanent	9	2	7
Monthly income	< 50000	15	10	38
	50000 - 150000	11	6	24
	160000 – 300000	35	4	15
	310000 – 500000	20	4	15
	Above 500000	9	2	8

Of the 26 participants diagnosed with H.pylori infection, a majority (50%) were single while none were widows/widowers. 23% of participants had attained a secondary level, 50% had primary level as their highest level of education and the highest positive H. pylori infection, and participants had no education background with 15%. Followed by the lowest numbers were from tertiary noted by 12%

From the evidence in Table 1, 42.2%of the participants were males, positives were 11(42%) participants were positive and 57.8% were females and positives were 15(58%) that were recruited in the research.

Out of 90 participants, 32.2% of the participants were singles 50% of the total prevalence was captured here, 36.5%was the married people 27% of the married were positively involved in the study and no positive H. pylori infection was found in widows/widower.

The population of family members was obtained in the 0-4 members group with a prevalence of 15 and a tie of 42%in groups of 5-8 and above 9 members

In the category of monthly income, the highest h. pylori infection was got from >50000 with a prevalence of 33% and lowest prevalence of 8 from above 500000.

In Table 3, there are some of the behavior factors associated with the prevalence of H. Pylori disease in patients attending OPD at Bumanya HC IV

Table 3; The level of washing hands.

Variable	Parameter	Frequency	positives	Percentage (%)
Washing hands when preparing food	Yes	28	6	23
	No	62	20	77
Washing hands after visiting latrines	Yes	81	19	73
	No	09	7	27

The idea of washing their hand when preparing food was not being practiced with an alarming percentage of 77% of the

infections being from not washing their hands and only 23% washed their hands when preparing food. The issue of washing hands after using the latrine was being practiced and a percentage of 73% washed hands after using the latrine and 27% did not.

DISCUSSION.

Prevalence of H. Pylori infection among the patients attending OPD in Bumanya HC IV.

The study showed that the overall prevalence of H.pylori infection among patients attending OPD in Bumanya HC IV in Kaliro district is 29% of the participants. This finding agrees with the prevalence reported by Tsongo and others in Uganda which indicated a prevalence rate of 29.9%. (Tsongo *et al*., 2015). This similarity can be attributed to ignorance, low standards of living shared by the rural people, and unhygienic sanitation

The most affected age group affected by H. Pylori in BumanyaHC IV.

The study revealed that the age group most affected by H.pylori infection among patients attending OPD in Bumanya HC IV in Kaliro district is 18-35 years with a prevalence rate of 42.3%. This result is different from the study conducted in Kampala by Hestviket et al in 2010 reported an overall prevalence of 43.3% among children in a community-based cross-section survey (Hestvik*et al*., 2010). This could be explained by children having too much exposure to an unhygienic environment that is not in rural where adults are exposed to it when looking for a living

Factors associated with the prevalence of h. pylori infection in patients attending OPD at Bumanya HC IV.

According to this research, participants who attained Primary as the lowest level of education were the most affected, 13(50%) by H.pylori infection. This could be attributed to the ignorance of the participants at this level about the etiology, transmission control, and prevention of H.pylori infections. In the same vein, single participants were the category most affected by H.pylori with a prevalence of 50%. This is probably due to reluctance in upholding hygienic and sanitation practices among such people.

Most of the unemployed participants, 15(16.7%), and those with a monthly income of less than 50,000 Uganda shillings, 10(38%) were positive for H.pylori infection according to this study. This is due to insufficient economic resources to purchase treatment and sanitation tools since most of them are peasants.

From the 26 participants sampled in this study, the highest proportion did not practice washing before food preparation 77% and after toilet use 27%

CONCLUSION.

The prevalence of H. Pylori in patients attending outpatient departments in Bumanya is 29% of the participants in the study.

Among the factors exposing patients to H. Pylori were poor hygiene, low level of education, and high level of unemployment leading to low income and standard of living.

STUDY LIMITATIONS.

Insufficient time to conduct the study, a language barrier as most people understood only Lulamogi (local language), and participants requesting money to participate in the study

RECOMMENDATIONS.

There is a need for more sensitization and mass education of people about H. Pylori disease.

District leaders should emphasize children be kept in schools to have better jobs and increase their monthly income.

Let the leaders' lobe for their people's jobs and money to start a small business

National Medical Stores to supply drugs in the health facility to reduce the burden of patients buying drugs.

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Finally, I acknowledge the patients at the OPD of Bumanya Health Centre IV for accepting to participate in my study.

LIST OF ABBREVIATIONS.

H. pylori:	Helicobacter pylori.
MALT:	Mucus-associated lymphoid Tissue.
SAT/SATs:	Stool Antigen Test(s).
HC IV:	Health Centre IV
OPD:	Out Patient department

SOURCE OF FUNDING.

The study had no source of funding

CONFLICT OF INTEREST.

The author declares no competing interests.

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