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Original Article

PREVALENCE OF H. PYLORI INFECTION AMONG PATIENTS ATTENDING OUTPATIENT DEPARTMENT AT OUR LADY OF CONSOLATA, KISUBI HOSPITAL. A CROSS-SECTIONAL STUDY.

Catherine Tusingwire*, Fortunate Lujjimbirwa
University of Kisubi.

Abstract.

Background

H. pylori is one of the most common chronic bacterial infections of humans having a worldwide distribution affecting more than 50% of the world's population and among those hundreds of million people will develop peptic ulcerations during their lifetime. This study determined the Prevalence of *H. pylori* infection among patients attending outpatient departments at Our Lady of Consolata, Kisubi Hospital.

Methodology.

A descriptive cross-sectional study was employed, and 115 study participants were enrolled using a simple random sampling technique. A semi-structured questionnaire was used to collect information on demographic data, family structure, socio-economic status, level of education, type of drinking water, and hygienic habits of the study participants, stool samples collected from the study participants were tested for the presence of *H. pylori* using *H. pylori* antigen test strips.

Results.

Among the respondents, 45 (39.1%) were male, and 53.0% of the participants had no formal education. The prevalence of *H. Pylori infection* was found to be 67.8%. The age group between 20-30 years had a positive frequency of 32.1% and infection was more prevalent among females 70 (62.8%) than males 45(37.2%).

Conclusion.

The study established prevalence above the average prevalence rate, the age group (21-30) years had the highest prevalence, and females were more affected than males.

Recommendation.

Use of antibiotics to avoid infection recurrence and the post-treatment confirmation of *H. pylori* eradication after treatment using diagnostic tests.

Keywords: *Prevalence of H. Pylori infection, Our Lady of Consolata, Kisubi Hospital.*
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Corresponding Author: *Catherine Tusingwire*
Email: *tusingwirecatherine20@gmail.com*
University of Kisubi.

Background.

Helicobacter pylori (HP) infection is very common worldwide with proof from a new precise survey proposing that close to half of the total populace is tainted (Hooi et al., 2017b). This bacterium was first found in 1982 in stomach samples of patients with gastritis and peptic ulceration (Marshall & Warren, 1984). *Helicobacter pylori* is a motile gram-negative, corkscrew-shaped, oxidase-negative, catalase-negative, urease-positive, and microaerophilic bacillus. Microaerophilic has greatly contributed to its survival in the stomach, as it requires only about 4% oxygen, 5% carbon dioxide, and 5% hydrogen to grow and survive. It is very mobile because it has several lines coming out of one rounded end. (Namyalo et al., 2021)

Almost half of the worldwide populace has been in irresistible status with this bacterium.(Sachs et al., 2011).

The occurrence of *H. pylori* disease can be impacted by sterile circumstances and financial status. Accepting it as a case, the occurrence of *H. pylori* disease in the UK and USA was 13.4 and 27.1%, separately(Peleteiro et al., 2014) while in undeveloped nations such as Chile, Turkey, and Bangladesh, its prevalence can reach 73.4, 74.6 and 92% (Ozaydin et al., 2013). The difference in contamination rate has been depicted in a lot of examinations, nonetheless, the

specific course of transmission and potential gamble factors have not been very much clarified.

Many studies from Africa have shown high prevalence, for example, 81.7% in Nigeria, 53.0% in Egypt(*Diab et al 2018*.), 39.1% in Tanzania, 64.39% in Cameroon (Kouitcheu Mabeku et al., 2018), 73.3% (among children) and 54.8% (adults) in Kenya. (Namyalo et al., 2021). Some studies on the prevalence of *H. pylori* have been conducted in Uganda; For example, studies in Kampala reported an incidence of 87% in patients with gastric and other cancers, 44.3% in children aged 0-12 years, and 60.5% in pregnant women at Kawempe Health Center (Baingana et al., 2014)

In Uganda, especially in the urban areas of Kampala, the prevalence of this common infection, especially in corporate clinics such as Africa Air Rescue (AAR). These clinics provide medical services mostly to middle-and high-income people. Regardless of economic status, the consequences of *H. pylori* infection are harmful or even irreversible if poorly treated (Tsongo et al., 2015). However, there is still little data on the trends and burden of *H. pylori* in urban areas such as Kampala, especially among the elite seeking medical care at AAR clinics, hence the need for this study. A study conducted in Ethiopia among dyspeptic patients showed that out of 209 study participants, 151 study participants were *H. pylori* seropositive, giving an overall prevalence of 72.2% of *H. pylori* infection (Belay et al., 2020)

A study of the prevalence of *H. pylori* among students with stomach ulcers attending the School of Health Technology Gwadabawa, Sokoto, Nigeria, showed that out of the 147 subjects tested, 116 were positive and 31 were negative giving an overall prevalence of 78.9%(Jidda et al., 2018). The prevalence of *H. pylori* infection has been reported to range from 41.5% to 72.3% in China, varying with socioeconomic status and hygiene level(Ren et al., 2022).

A new survey, including worldwide examinations distributed somewhere in the range of 2000 and 2014, inspected the commonness of *H. pylori* contamination in different African, South American, Asian, and European general grown-up populaces. This survey showed that the commonness of contamination changed by country (18.2-60.5% in Uganda, 68.6% among pregnant ladies in Chile, 80% in Bolivia, 83.4% in China, 29.4-54.5% in Japan, 76.5% and 47.9% among the Yami and Han ethnic gatherings in Taiwan, separately, 72.1% in Italy, and 84.2% in Poland). (Alsulaimany et al., 2020).

In developing countries, 70-90% of the population carries *H. pylori*, which is mainly acquired during childhood. *H. pylori* is mainly transmitted orally or fecal-oral. The general spread of infections is facilitated by a lack of proper sanitary conditions, clean drinking water, and basic hygiene, as well as poor nutrition and overcrowding. The spread of the bacterium occurs due to poor environmental sanitation and cramped conditions, including fecal contamination of water sources. In addition, the continued emergence of resistance to traditional antibacterial drugs used to treat *H. pylori* infections presents a challenge to the eradication of *H. pylori* in developing countries (Belay et al., 2020). This study determined the Prevalence of *H. pylori* infection among patients attending outpatient departments at Our Lady of Consolata, Kisubi Hospital.

Methodology.

Study design.

The study was cross-sectional where quantitative data was collected. A cross-sectional study is a type of observational study that analyzes data from a population or representative subset at a specific point in time(Simkus, 2023)

Study area.

The study was carried out at Our Lady of Consolata, Kisubi Hospital in Wakiso district. This is approximately 28 kilometers by road, southwest of Kampala, and the capital city of Uganda.

Study population.

The study was centered on 115 patients who attended the outpatient clinic at Kisubi Hospital during the period of study.

Inclusion criteria.

All patients who attended the outpatient clinic at Kisubi Hospital during the period of study and consented to participate willingly were included in the research.

Exclusion criteria.

All patients who did not consent to participate were excluded from the research.

Patients who needed emergency were excluded from the research

Sample size determination.

The sample size (N) was determined using a formula according to (Charan & Biswas, 2013) and prevalence (Hooi et al., 2017a)

N =

Where;

N was the sample size required,

P was the expected prevalence

D was the allowed error = 0.1

Z was the confidence interval (95%) = 1.96

Q=1-

P

N= = 115

Therefore 115 patients were recruited in the study.

Sampling technique.
A simple random sampling technique was used to obtain the sample size as discussed under the sampling procedure. This was so to reduce the bias while selecting the study participants who represented the entire population.

Sampling procedure.
A simple random sampling technique where a subset of a statistical population in which each member of the subset has an equal probability of being chosen to participate (Hayes, 2019) was used to obtain study subjects who met the inclusion criteria. The technique was used to reduce the bias of representing the entire population.
A list of all patients attending our Lady of Consolata Kisubi hospital every day of data collection was made with code numbers. A computer was used to generate random numbers equivalent to the sample size. Then only the individuals with serial numbers corresponding to those generated by the computer qualified to be recruited for this study. The purpose of the study was explained to the selected study subjects. Participants to be surveyed were asked to consent to be recruited for this study.

Laboratory methods used for examination.
The rapid, one-step *H. pylori* card test (H+R *H. pylori* CARD, Madrid, Spain) was used to investigate the presence of *H. pylori* antigens in the stool samples. This test is a qualitative immunochromatographic assay for the determination of *H. pylori* in stool samples. The membrane is precoated with monoclonal antibodies, on the test band region, against *H. pylori* antigens. During testing, the sample is allowed to react with the colored conjugate (anti-*H. pylori* monoclonal antibodies-red polystyrene microspheres) pre-dried on the test strip. The mixture then moves up the membrane by capillary action. As the sample flows through the test membrane, the colored particles migrate. For a positive result, the specific antibodies present on the membrane will capture the colored conjugate. The mixture continues to move across the membrane to the immobilized antibody placed in the control band region, where a red band always appears. The presence of this red band serves as; an internal control for the reagents and verification that sufficient volume was added and proper flow was obtained. The stool samples were evaluated by the card test according to the manufacturer's protocol. A single red band appearing across the central window in the site marked with the control line was considered negative. A red band appearing in the site marked with the result line and in the site marked with the control line was considered positive. A total absence of the control band, regardless of the appearance of the result site was considered invalid. (Calik et al., 2016)

Data collection method.
Oral interviews using a pre-tested semi-structured questionnaire were used as a method of data collection to get data from study participants to enable also the illiterate to understand the questions and give the appropriate response.

Data collection tool.
A semi-structured questionnaire was used to collect information on demographic data, family structure, socio-economic status, level of education, type of drinking water, and hygienic habits of the study participants, in order to control for potential bias.
H. pylori antigen test strips were used for testing for the presence of *H. pylori* in stool samples collected from the study participants.

Data collection procedure.
The purpose of the study was explained to each study participant and consent was sought from each study participant on each day of data collection. A face-to-face oral interview with each study participant was conducted to collect data on demographic data, family structure, socio-economic status, level of education, type of drinking water, and hygienic habits of the study participants. Then a sterile stool container labeled with the participant's identification number was provided to each participant and asked to collect stool samples using the scoop within the container and bring them to the laboratory for testing. Each stool sample was tested for the presence of *H. pylori* antigen using *H. pylori* antigen test strips. It is an immunoassay-based qualitative test for the detection of H. pylori in human fecal specimens. A small portion of the stool sample was diluted in the test buffer and mixed very well then 3 vertical drops were added to the sample well on the test device and waited for 15 minutes to read the results. The presence of rose-pink color bands in both the control and test regions was indicative of the presence of *H. pylori* antigens in the stool (Positive result). The presence of a rose-pink color band at the control region only was indicative of absence of *H. pylori* antigen in stool (Negative results). The results were recorded and used for determining the prevalence of *H. pylori* among patients attending our patient clinics at our Lady of Consolata Kiss Hospital.

Quality control.
To ensure the validity of data collection, the data collection tool was given to the research supervisor to evaluate the relevance of the tool to earlier stated research-specific objectives.
To establish reliability, a research assistant was trained on how to collect and test stool samples for *H. pylori* using *H. pylori* test kits. Also, standard operating procedures were followed during the collecting and processing of stool

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samples. All test kits that were being used were checked for the expiry date before being used to avoid using expired kits that may produce false results.

Data analysis and presentation.

Data collected was checked and manually organized into data entry form, sorted and manually computed using simple hand calculators, and then the whole information was fed into a computer Microsoft Excel program for analysis and presentation into statistical tables, pie charts grouped bar graphs, and then discussed, printed.

Ethical considerations.

The principal investigator presented an introductory letter from the faculty of health sciences to the in charge of our Lady of Consolata Kisubi Hospital to conduct this study among out-patients attending his facility. The in-charge then granted permission for this study to be conducted. Informed consent was obtained from the patients before they were recruited. The names of the respondents did not appear anywhere in the result tally sheet instead study numbers were used on questionnaires to ensure confidentiality of the study participants.

Results.

Socio-Demographic Characteristics of the Respondents.

Table 1: showing the Age of respondents.

Age	Frequency	Percent (%)
Below 20	32	27.8
20-30	29	25.2
31-40	27	23.5
41-50	13	11.3
Above 50	14	12.2
Total	**115**	**100**

Table 1: shows that respondents were in the age range from less than 20 years, 20 to 30 years, 31–to 40 years, 41 to 50, and 50 years and above. Summarize the results. The findings indicated that respondents range in age. It was discovered that the most frequent age was below 20 years with 27.8%, while the less frequent age was between 41 and 50 years with 11.3%

Table 2: Gender of the respondents

Gender	Frequency	Percent
Male	45	39.1
Female	70	60.9
Total	**115**	**100.0**

Table 2: indicated that among reached out respondents, 45 (39.1%) were male while 70(60.9%) were female. This indicated that females dominated the hospital.

Table 3: showing the level of education.

Level	Frequency	Percent
Primary	29	25.3
Secondary	15	13.0
Tertiary	10	8.7
No formal education	61	53.0
Total	**115**	**100.0**

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Table 3: indicated that respondents had varying levels of education, no formal education had the highest frequency of 53.0% while the lowest level of education was depicted in the tertiary level with 8.7%.

Table 4: Showing marital status

Status	Frequency	Percent
Single	47	40.9
Married	68	59.1
Total	115	100

Table 4: indicate that 47(40.9%) of respondents were single, 68(59.1%) of the respondents were married and findings of the study indicated that the majority of the respondents were married.

Figure 1: Showing prevalence profiles of H. pylori infection among patients attending the outpatient department at Our Lady of Consolata, Kisubi Hospital.

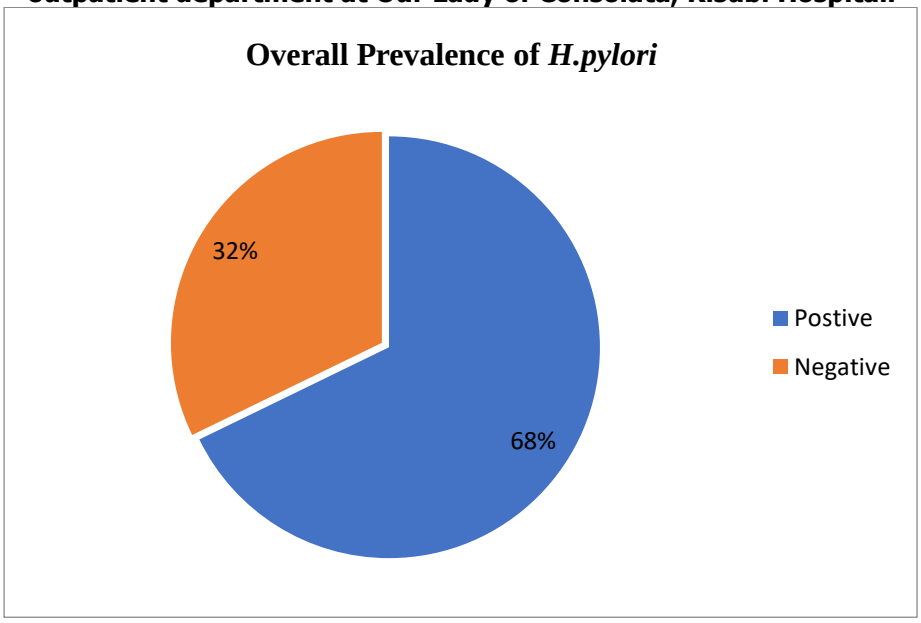

Figure 1: shows that, out of 115 study participants it was found out that tested 78(67.8%) *H. pylori* positive while 37(32.2%) tested *H. pylori* negative.

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Figure 2: Showing prevalence according to age group by H. pylori infection

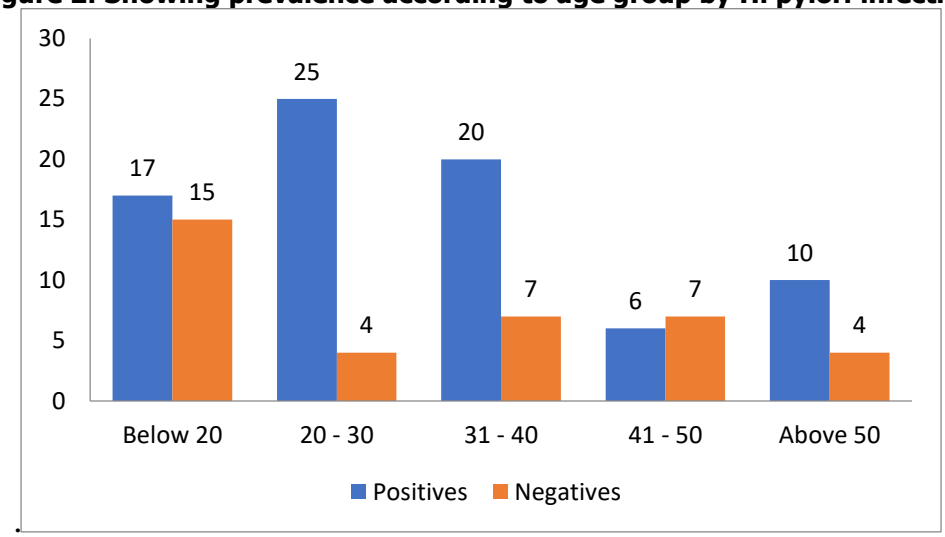

Figure 2: showed that, the age group of 20 - 30 had the highest frequency of 32.1%, whereas (41-50) (7.7%) had the lowest frequency of *H. pylori.* Data was collected on age and grouped as shown below. The age group below 20 years had a positive frequency of 21.8%, 20-30 years had 32.1%, 31-40 years had 25.6%, 41-50 years had 7.7%, and above 50 years had 12.8%.

Figure 3: Showing prevalence according to gender by H. pylori infection

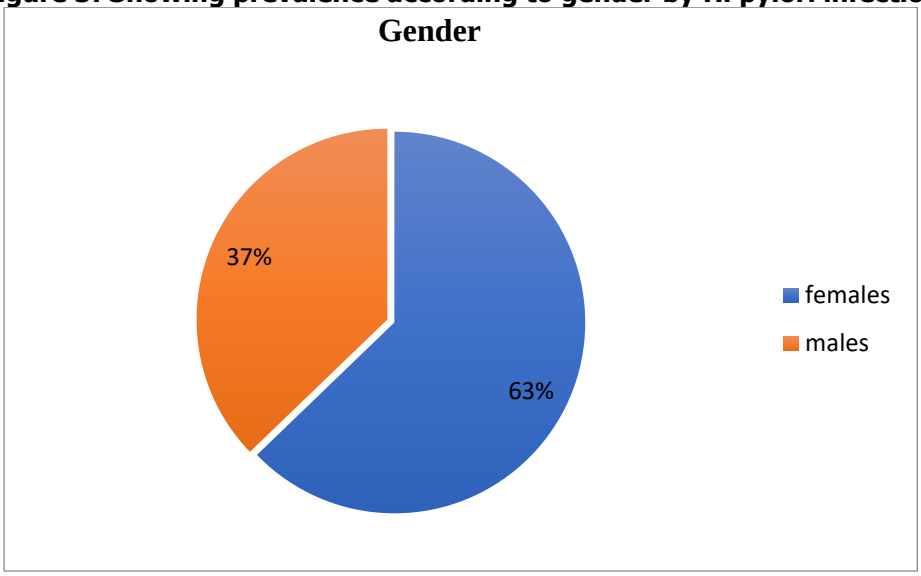

Figure 3: showed that, out of 115 study participants, 70 were females with a prevalence of 62.8% while 45 were males with a prevalence of 37.2%.

Discussion.

Prevalence of H. pylori infection

The data analysis and interpretation revealed that the overall prevalence was 67.8%. The prevalence of gender was 62.8% in females (OR=1.3(0.58-2.85) and 37.2% (OR=0.8(0.35-1.72) in males whereas highest in 20-30 years with a percentage of 32.1%. The findings of this study were attributed to poor quality of drinking water and poor personal hygiene which were observed among the study

population. The study findings were comparable with those done by Ren et al, 2022 who reported the prevalence to range from 41.5% to 72.3% in China, varying with the socioeconomic status and hygiene level(Ren et al., 2022) and 64.39% in Cameroon(Kouitcheu Mabeku et al., 2018) However, they were lower than those done (Namyalo et al., 2021) and (*Diab et al 2018*.)54.8% (adults) in Kenya found out the prevalence of 54.8% (adults) in Kenya, 34.1% in Tanzania and 53.0% in Egypt respectively. This is most probably due to the disease condition, nature and geographical locations of the study participants, and the testing methods used. Regarding the prevalence among the gender, the study was in line with a study done by(Wang et al., 2019) who found that the prevalence of *H.pylori* was high in females than males (49.2% vs. 47.9%) respectively. The way gender contributes to the *H. pylori* prevalence is still unelaborated but it is becoming widely recognized that there are gender differences in various diseases.

Still in a study done by (Wang et al., 2019)the prevalence in terms of age was high in individuals below the age of 36 years and significant ($r=0.91$, $p < 0.001$), this was in line with the current study whereby age bracket of 31 to 40 downwards expressed the highest prevalence of *H.pylori*. this was attributed to the fact the *H. pylori* transmission is mostly acquired during childhood and this remains with the individual unless eradicated.

Conclusion.

This study generally sought to determine the prevalence of *H. pylori* among patients who attended the patients' clinic at our Lady of Consolata Kisubi Hospital in Wakiso district from 22nd Feb 2024 to 14th April 2024. The study established prevalence at 67.8%, age group (21-30) years had the highest prevalence, and females were more affected than males.

Study limitations

The major limitation of this study was that it was conducted in a general hospital setting and this may not be a true representation of the prevalence of *H. pylori* infection in the entire community therefore the study findings are only limited to health centres.

Recommendations.

Use of antibiotics to avoid recurrence of infection and the post-treatment confirmation of *H. pylori* cure after treatment using diagnostic tests.

The researcher recommends similar research to be done in the entire community to provide a general prevalence of *H. pylori* infection.

Acknowledgment.

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Lastly, I extend my sincere thanks to all my tutors and classmates who have always been with me throughout this journey and working hard for me to achieve my goal I pray that God rewards you for your efforts.

List of Abbreviations and Acronyms.

MALT	Mucosa-associated lymphoid tissue
MOH	Ministry of Health
OPD	Outpatient department
PUD	Peptic ulcer disease
SES	Socioeconomic status
SOPS	Standard Operating Procedures
WHO	World Health Organization
C-UBT	C-urea breath test

Source of funding.

The study was not funded.

Conflict of interest.

There is no conflict of interest.

Authors biography.

Catherine Tusingwire is a student of Bachelor of Biomedical Laboratory Technology at the University of Kisubi.

Fortunate Lujjimbirwa is a research supervisor at the University of Kisubi.

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Address: Scholar's Summit Nakigalala, P. O. Box 166256, Entebbe Uganda, East Africa