PREVALENCE AND ASSOCIATED FACTORS FOR *HELICOBACTER-PYLORI* SEROPOSITIVITY AMONG ADULT PATIENTS VISITING OUTPATIENT DEPARTMENTAT JIMMA UNIVERSITY MEDICAL CENTER, SOUTHWEST ETHIOPIA

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Abstract

Background: *Helicobacter pylori* infects more than 50% of the world's population with higher prevalence in developing countries than developed countries. The prevalence of *H. pylori* varies in different societies and geographical locations. Although there are some studies done on the prevalence of the problem and its associated factors in other areas of Ethiopia, there is no similar study done in Jimma.

Objective: To determine the prevalence and factors associate with-*Pylori* infection among adult patients visiting outpatient department of Jimma University Medical Centre.

Methods: Hospital based cross-sectional study was conducted on 306 patients aged ≥18 years at Jimma University Medical Center attending outpatient department from July30, 2018 to August 11, 2018. Data was collected using structured questionnaire. Systematic sampling technique was employed to select study participants. *Helicobacter pylori* immunoglobulin(IgG) serology test was used for each participant. Data were analyzed using SPSS Version 20. Descriptive statistics was employed to describe each variables and Multivariable logistic regression analysis was used to identify associated factors of *H.pylori*. Adjusted odds ratio (AOR) and 95% confidence interval (CI) for each variable of interest was calculated. $P < 0.05$ was used as level of statistical significance.

Results: The overall prevalence of *H. pylori* infection was 53.3%.Multivariable regression indicated that family size [AOR=1.9, 95%CI=1.033-3.617], unprotected source of drinking water [AOR=2.480, 95%CI=1.231-4.995], not hand washing habit after toilet[AOR=2.7, 95%CI=1.316-5.659], eating raw vegetables and fruits[AOR=3.012, 95%CI=1.671-5.429] were significantly associated with the risk of infection. Conversely, study participants who didn't sharing drinking cup/glass were protective against infection[AOR, 0.303, 95% CI=.156-.586].

Conclusions: The prevalence of *H. pylori* was high in the study area. Age, family size, eating raw vegetables and fruits, poor hand hygiene practices, and unprotected sources of drinking water were associated with seropositivity of *H. pylori*. Thus, to understand the underlying mechanisms for *H. pylori* colonization and infection, further investigation in the area is needed.

Key words: -*H. Pylori* Infection, Jimma University Medical Center, Ethiopia

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List of Abbreviations

ART Antiretroviral treatment

CEO Chief Executive Officer

GI Gastrointestinal

H. Pylori *Helicobacter pylori*

IgG Immunoglobulin

IRB Institutional Review Board

JU Jimma University

MALT Mucosal associated lymphoid tissue

MOPD Medical outpatient department

MRC Medical referral clinic

PUD Peptic ulcer disease

SOPD Surgical outpatient department

SRC Surgical referral clinic

CHAPTER ONE: INTRODUCTION

1.1 Background

Helicobacter pylori is a gram negative bacterial which colonizes the gastric mucosa of the gastrointestinal tract. Generally, about 50% of adults in the developed countries and 90% of adults in the developing countries are seropositive for *H. pylori*(1).

Globally, *H. pylori* infect an estimated 4.4 billion people annually. Countries with the highest prevalence are Nigeria (87.7%), Portugal (86.4%), and Estonia (82.5%); countries with the lowest prevalence are Switzerland (18.9%), Denmark (22.1%), and New Zealand (24.0%)(2).

This organism is a spiral shaped gram negative bacilli that is oxidase, catalase and urease positive and grows slowly in culture(3). The bacteria have been implicated for acid peptic disease and today it is regarded as essential factor and also causative agent of gastritis and peptic ulcer diseases. Additionally, the organism is also responsible for gastric adenocarcinoma and mucosa associated lymphoid tissue (MALT) lymphoma(4, 5).

The growing attention given to *H. pylori* by academicians and clinicians is not surprising since this pathogen colonizes more than at least half of the world's inhabitants with an evident geographical variation in its epidemiology. This geographical variation is believed to be largely due to socio economical, age, gender, genetic predisposition and sanitation.

1.2. Statement of the problem

*Helicobacter pylor*i is a gram-negative bacillus that naturally colonizes the gastric mucus. The organism has several acid-resistance mechanisms, most notably a highly expressed urease that catalyzes urea hydrolysis to produce buffering ammonia(6).

H Pylori is microaerophilic, slow-growing bacteria with sero-prevalence of 50% of adults in the developed countries and 90% of adults in the developing countries(3).

H. pylori is spread by person-to-person contact; in developed countries usually from primary care giver to child, and in developing countries usually between children themselves. The most common route of transmission is thought to be oro-oral or vomito-oral rather than faeco-oral, as *H. pylori* is easily cultured from vomitus or gastro esophageal refluxate,but is very difficult to culture from stool. Either way, the numbers of potential sources for transmission along with the standard of living conditions in early childhood are the key determinants of prevalence within a cohort. These in turn are influenced by factors including socioeconomic status, family education level, sanitation, economic development, and freedom from the effects of war and natural disasters(7).

Increased availability and use of antibiotics, particularly in childhood for inter current illness, likely also contribute to the continued decline in *H. pylori* prevalence in developed countries. Local differences in prevalence exist where there has been substantial immigration from countries with a higher prevalence of infection. Some reports suggest that certain ethnic and racial groups are at increased risk not fully explained by socioeconomic difference, such as Hispanics and African-Americans when compared with Caucasians. Twin studies support a role for genetic susceptibility, but also reinforce the importance of childhood environment(7).

H. pylori is a major cause of peptic ulcer disease (PUD). In many reports, it has been estimated that 15% to 20% of people infected with *H. pylori* will develop ulcers. Some evidences also link *H.pylori* infection to gastric cancer, gastric mucosa-associated lymphoid tissue (MALT) lymphoma, and perhaps pancreatic cancer and cardiovascular disease(8). The risk of these diseases is determined by bacterial virulence, host genetic susceptibility and immune response, and by environmental factors(7).

As noted in a review by Barik(9) on *H.pylori* infection in developing countries, it was obvious that the health economics of managing *H. pylori* infection to prevent the occurrence of peptic ulcer and gastric cancer is highly expensive. Therefore, investigating the magnitude

and contributing factors for the infection in the area is important to eradicate *H. pylori* and apply prevention and control measures. This should be done based on the data that show the association between *H. pylori* infection and dyspepsia.

Some studies were conducted on the seroprevalence and risk factors of *H. pylori* infection from outpatient department patients in Ethiopia. However, such studies have reported inconsistent findings because the seroprevalence and risk factors of *H. pylori* vary with geographic location, ethnicity, and demographic factors of people both among and within populations(9).

Therefore, there is a need for each community to determine its own prevalence and make attempts to delineate the epidemiologic factors which may be associated with the infection to eradicate *H. pylori* infection and apply appropriate and efficient prevention and control measures. However, no study has been done in this problem in Southwest of Ethiopia. The aim of this study is therefore to determine the seroprevalence and associated factors of *H. pylori* infection among outpatient department patients in medical outpatient department at Jimma University Medical Center, southwest Ethiopia.

CHAPTER TWO: LITERATURE REVIEW

Helicobacter pylori is one of the chronic bacterial infections, which colonizes the stomach in 50% of the world's population, the global prevalence of *H. pylori* is estimated to be 4.4 billion people. Countries with the highest prevalence were Nigeria (87.7%), Portugal (86.4%), and Estonia (82.5%); countries with the lowest prevalence were Switzerland (18.9%), Denmark (22.1%), and New Zealand (24.0%)(10, 11).

In many countries, the incidence of *Helicobacter pylori* infection has been decreasing in association with improved standards of living. Yet the prevalence of this bacterium is still ubiquitous, especially in the Far East. It is the main cause of chronic gastritis and the principal etiological agent for gastric cancer and peptic ulcer disease. In most regions, the main mechanism of spread is interfamilial transmission. The prevalence remains high in most developing countries and is generally related to socioeconomic status and levels of hygiene (12-14)

The prevalence of *H.Pylori* among adults is <30% in most parts of the United States and in other developed countries as opposed to >80% in most developing countries. *H. pylori* is usually acquired in childhood**.** The age association is due mostly to a birth-cohort effect whereby current 60-year-olds were more commonly colonized as children than are current children(6).

The prevalence of *H.pylori* is influenced by the socio-demographic characteristics, socioeconomic status, hygiene and life style of the population(9). Poor sanitary conditions, overcrowding, and unsafe water supply sources are the risk factors associated with *H. pylori* infection(15). Gender, age, occupation and alcohol consumption are among the socio-demographic factors that influence the prevalence of *H. pylori* (9-12).

A prospective epidemiologic survey of *H. pylori* infection accomplished in 2008 in a natural population of 1457 individuals in Xiangshui and Gaoyou counties, Jiangsu Province, China. Among 1371 subjects who completed questionnaires and *H. pylori* detection, 851 (62%) were *H. pylori* positive(16).

A prospective epidemiologic survey of *H. pylori* infection was accomplished in 2008 and 2009 involving 516 asymptomatic individuals of Barakaho, Islamabad, Pakistan. A

total of 516 individuals participated in the study of which 384 (74.4%) were positive for H. pylori infection(17).

The prevalence was 73.5% in males and 75.4% in females and increased with increasing age. Presence of household animals and more family members were significantly correlated with *H. pylori* prevalence while no association was seen with other risk factors such as education level, drinking water source, number of rooms in house and monthly family income(17).

The prevalence of *H-pylori* infection was studied in 138 patients with dyspepsia in a hospital in Nakuru, Kenya, and in 138 asymptomatic sex- and age matched controls from the same population. *H-pylori* Infection was more prevalent in Outpatient Department than asymptomatic persons (71% vs. 51%), particularly those <30 years old (71% vs. 38%)(18).

H-pylori infection in asymptomatic residents of Nakuru, Kenya, was more prevalent in older persons, with a rate of 68%, than in those 31–40 years of age. However, young persons with dyspepsia had an unexpectedly high prevalence of *H-pylori* infection(18).

A comparative cross-sectional study was conducted among dyspepsia and non-dyspepsia adults from March 2015 to October 2015 at Assosa General Hospital in Ethiopia. Of a total of 230(115 Outpatient Department and 115 non-Outpatient Department) study participants, overall 112(48.7%) antigens of *H. pylori* were detected. The prevalence of *H. pylori* was significantly associated with which gender in both dyspepsia and non-dyspepsia adults. Further, the prevalence of H. pylori infection was significantly higher in dyspepsia patients 67/115 (58.3%) than non-dyspepsia 45/115 (39.1%) individuals(19).

There was no significant association among age groups. Similarly, no significant association was observed in the prevalence of *H. pylori* with family size, educational status, marital status, toilet use habit, blood groups and occupation. *H. pylori* infection was significantly associated with which gender, residence area and hand washing habit after latrine. Alcohol drinking, coffee consumption, cigarette smoking and chat chewing had no significant association with *H. pylori* infection(19).

A cross-sectional study involving 209 Outpatient Department patients was carried out from February 15 to April 30, 2013 in Debretabor General Hospital; Northwest Ethiopia a total of 209 Outpatient Department patients (90 males and 119 females) took part in this study. One hundred fifty-one of the study participants were *H. pylori* seropositive, giving an overall prevalence of 72.2%. Seventy (77.8%) of male and 81 (68.1%) of female patients were

positive for H. pylori and there was no statistically significant difference in the prevalence of *H. pylori* with respect to gender(20).

The seroprevalence of *H. pylori* increased with age from 60% in patients less than 20 years of age to 79.1% in age groups between 31- 40 years(20). There was statistically significant difference in the prevalence of *H. pylori* among age groups(20).

The seroprevalence of *H. pylori* was higher (76.4%) in those participants who use unprotected surface water than those who use piped tap water (65.9%)(20). Among 178 Outpatient Department patients that have access to latrine, (73%) were found to be positive to *H. pylori* compared to a 67% prevalence in those who do not have access to latrine(20). A comparable seroprevalence was obtained among the patients who had the habit of hand washing after visiting the toilet. There was statistically significant difference in prevalence of *H. pylori*and the habit of alcohol consumption and hand-washing before meal(20).

Compared to those who do not take alcohol, alcohol consumers have 2.72 times higher chance of infection with *H. pylori*. Study subjects who depend on untapped drinking water sources are 1.37 more exposed to H. pylori than those who use piped water(20).

The diagnostic methods particularly for epidemiological studies, remains unclear. Currently, several direct diagnostic tests, including histopathology and/or immunohistochemistry (IHC), rapid urease test (RUT), and culture are frequently used as they provide genotype and antibiotic resistance information. However, due to the small amount of bacteria that colonizes the stomach, the direct test sensitivity decreases. Thus, several indirect tests, including antibody-based tests such as serology and urine test, urea breath test (UBT), and stool antigen test (SAT) have been developed to diagnose *H. pylori* infection. Among the indirect tests, UBT is one of the most accurate to determine *H. pylori* infection with a sensitivity and specificity of 99% and 98%, respectively (21, 22).

The most clear-cut indications for treatment are *H. pylori* related duodenal or gastric ulceration or low-grade gastric B-cell lymphoma. Whether or not the ulcers are currently active, *H. pylori* should be eradicated in patients with documented ulcer disease to prevent relapse. If the community prevalence of *H. pylori* is below ~20%, such patients are treated with a short course of acid suppression using a PPI. If these patients do not respond or relapse when treatment is stopped, or if the *H. pylori* community prevalence is >20%, all national guidelines recommend a strategy of testing for *H. pylori* noninvasively and eradicating it if it

is found. This strategy will benefit patients who have peptic ulcers and the 10% of patients who have functional dyspepsia responsive to *H. pylori* eradication, but most patients will be treated unnecessarily(23).

The increasing prevalence of antimicrobial resistance has warned clinicians to adopt new strategies for dealing with the *H. pylori* infection. The success of various therapeutic regimens has recently declined to unacceptable levels. To date, first line therapies (including concomitant therapy and hybrid therapy), second line therapies (including bismuth-containing quadruple therapy and levofloxacin-containing therapy), and third line therapy (culture-guided therapy) had been introduced. In the near future, treatment of H. pylori is entering into a completely new resistance era (24, 25).

The eradication of *Helicobacter pylori* (*H. pylori*) can be challenging in certain circumstances. There is no current first-line therapy that is curative in all patients. Designing a new therapeutic regimen which contains most effective available antibiotics with less possible side effects and high patient compliance would be the most challenging topic in *H. pylori* future prospective; selecting a therapy to eradicate *H. pylori*, duration of treatment and adverse effects should be considered Although current guidelines continue to recommend established therapies for first-line management of *H. pylori*, general practitioners should be aware of these new strategies such that these options could be applied when traditional therapy fails. (26, 27).

Determining *H Pylori* seroprevalence and associated factors is important to design appropriate intervention program in this particular study area. The prevalence and risk factors of H. pylori seroprevalence varies between and among different populations groups. This suggests that different parameters such as Socio-demographic, economic, environmental Sanitation and behavioral risk factors play a key role in the acquisition of H. pylori infection. Conducting assessment on such factors provides important information regarding the epidemiology and transmission of H. pylori infection (28, 29). As little is known about prevalence and associated risk factors of H Pylori Infection in both symptomatic and asymptomatic patients in the study area, this study had tried to provide pertinent information on prevalence and associated factors of H Pylori seropositivity.

2.1 Significance of the Study

The health economics of managing *Helicobacter pylori* infection to prevent the occurrence of peptic ulcer and gastric cancer is highly expensive. Moreover, the issue of drug resistance is another current challenge for overt use of antibiotics for eradication of the infection and colonization. Therefore, this study will enable us to know the magnitude and contributing factors for the infection in patients attending Jimma University Medical Center for various ailments. It will help evidences and justifications for eradication therapy for *Helicobacter pylori*, and apply prevention and control measures that are appropriate and efficient to the nation and the local community in particular.

Such information will be critical for the development of locally sensitive guidelines, research programs and policies both for diagnosis and prevention *Helicobacter pylori* infection.

This study will be a very good entry point and source for further study to be done on morbidity and associated factors of *Helicobacter pylori* among adults in developing countries, in particular in Ethiopia.

The findings will be published in peer reviewed journals for a wider dissemination of the impacts to areas with similar settings.

CHAPTER THREE: OBJECTIVES

3.1. General objective

- To determine the seroprevalence and associated factors of *H-Pylori* among adult patients attending outpatient department at Jimma University Medical Centre, Southwest Ethiopia.

3.2. Specific objectives

- To assess the seroprevalence of *H. Pylori* among adult patients attending outpatient department.
- To identify factors associated with *H.Pylori* seropositivity among adult patients attending outpatient department.

CHAPTER FOUR: METHODS AND MATERIALS

4.1 study setting

The study was conducted at Jimma University Medical Center outpatient departments from July 30-August 11, 2018. The hospital is situated in Jimma zone, Jimma town southwest Ethiopia, 356 km away from the capital Addis Ababa. The Hospital serves as referral for 20 million populations in the southwest of the country. Jimma University Medical Center gives both inpatient and outpatient services of which internal medicine is one of them. The hospital provides various services in outpatient departments among the services medical outpatient constitute 34.5% of patients seen in outpatient department.

4.2. Study Design and Study Period

Hospital based cross sectional study design was used. It was conducted from July 30-August 11, 2018.

4.3 Selection of study participants

Patients visiting outpatient department of JUMC were used as source population

4.3.1 Study population

Adult patients of age 18 years and older visiting outpatient department of JUMC during the study period

4.3.2 Inclusion and Exclusion criteria

The Inclusion criteria:

- Adults age >=18yrs

The exclusion criteria:

- Individuals who did not consent
- Mental illnesses
- Debilitating medical conditions

4.4 Sample size and Sampling technique

4.4.1 Sample size

The sample is calculated using a formula for estimation of single population proportion taking prevalence of H *Pylori* infection from previous study to be 74.4%(19), margin of error 5%, and using 95% confidence level.

$n = (Z\alpha/2)^2 p (1-p) / d^2$

$Z\alpha/2$ = standard normal variable at 95% confidence level (1.96).

d= precision (tolerable margin of error)

$n = Z\alpha/2\ p\ (1-p)/d2 = (1.96)^2$ x 0.744 (1-0.744)/(.05)2 =292 participants.

Including non-response 5%, final sample size was 306.

4.5.2 Sampling technique

Systematic Stratified sampling technique was used with Interval (Kth) of 4(1375/306) and the first to be selected with lottery method. N=1375 is the total average number of patients seen in outpatient department during the study period. The strata being different OPD units with proportion of MOPD=52(225/1375*306), n=225 is the average number patients seen in MOPD(daily on average 23 patients are seen), SOPD=25(110/1375*306), n=110 is the average number patients seen in SOPD(daily on average 11 patients are seen) , Medical referral clinic=57(250/1375*306), n=250 is the average number of patients seen at MRC(daily on average 25 patients are seen), Surgical referral clinic=27(120/1375*306), n=120 is the average number of patients seen at SRC(daily on average 12 patients are seen) ANC clinic=23(100/137 *306), n=100 is the average number of patients seen at ANC(daily on average 10 patients are seen), Gyni OPD=9(40/1375*306), n=40 is the average number patients seen at Gyni OPD(daily on average 4 patients are seen),ART Clinic=23(100/1375*306), n=100 is the average number of patients seen at ART clinic(daily on average 10 patients are seen), Ophalmology OPD=46(200/1375*306), n=200 is the average number of patients seen at ophthalmology clinic(daily on average 20 patients are seen), Dental clinic=14(60/1375*306), n=60 is the average number of patients seen at Dental clinic(daily on average 6 patients are seen), Maxillofacial OPD =12(50/1375*306), n=50 is the average number of patients seen at Maxillofacial OPD(daily on average 5 patients are seen) & ENT OPD=27(120/1375*306), n=120 is the average number of patients seen at ENT OPD(daily on average 12 patients are seen).

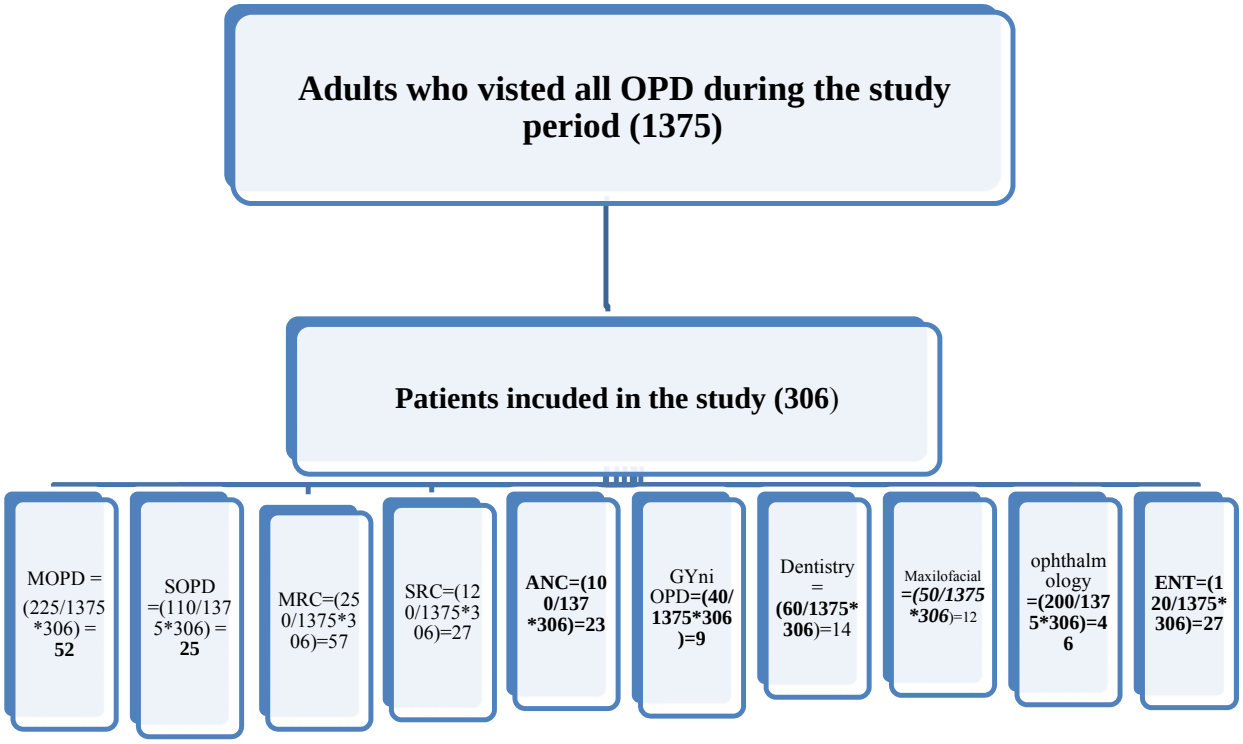

Figure 1 Schematic Presentation of Sampling Procedure

4.6 Data collection

An interviewer-administered structured questionnaire was used to assess the socio-demographic, environmental sanitation, behavioral and dyspeptic symptoms of the study subjects. Venous blood sample was taken the same day from the participants. The sample was analyzed for detection of *Helicobacter pylori* immunoglobulin (IgG**)** and the result was registered.

The questionnaire was prepared in English by the principal investigator by reviewing different related literatures and was translated to local languages (Afan Oromo and Amharic) by a health professional who is good in English, Afan Oromo and Amharic grammars and was checked for consistency by a third independent person competent in all the mentioned languages.

The data collector and assistant were trained with demonstrations on the questionnaires by principal investigator for one day on the instruction of data collection ahead of the data collection schedule. The necessary tools for the data collections were given to the data collector ahead of time and data collection was supervised daily. The data assistant arranged the equipment needed for the data collection, cross checked the collected data for completeness and finally the collected data was checked by principal investigator before entry in to the computer.

4.7 Variables

Dependent variable

- *H. Pylori* seropositivity

Independent variables

- Age
- Sex
- Occupation
- Educational attainment
- Residence
- Family size
- Dietary habits
- Handwashing practice,
- Taking Shower
- Habit of Tooth brushing
- Drinking water source

- Habit of Alcohol consumption,
- cigarette smoking
- Contact & exposure to animals, mice all variables associated with H-Pylori infection
- Dyspeptic symptoms

4.8 Data analysis

The completed questionnaire from each study participant was checked for completeness by the principal investigator. Data editing and cleaning was performed to check for accuracy, consistency & missing values. Completed questionnaires were coded and were entered to computer using SPSS version 20.0.Data was summarized and descriptive statistics was computed for all variables according to type. Frequency, mean and standard deviation was calculated for continuous variables and categorical variables were assessed by computing frequencies. Crude odds ratio (OR) and 95% confidence interval (CI) for each variable of interest was calculated. Finally, all independent variables associated with *H. Pylori* seropositivity with of $p < 0.25$ by bivariate analysis were entered into multiple logistic regression models to evaluate independent association. Adjusted odds ratio was calculated for each exposure variables to see the extent of the association between independent and dependent variable. $P < 0.05$ was considered as statistically significant.

4.9. Data Quality Assurance

The questionnaires were pretested to minimize errors on 15(5%) study participant on similar setting. Data collector and data assistant were trained prior to data collection. During data collection, the collected data was checked daily for completeness by data assistant.

4.10 Ethical consideration

Ethical clearance was obtained first from Institutional Review Board (IRB) of the College of Health science and Medicine of JU. Purpose & significance of the study was explained and informed written consent was received from each study subject. Patient's confidentiality, equity of services and interests of patients was ensured during the study period by informing the data collectors on ethical issues. This study doesn't involve any potentially harmful intervention to the patient. The interview scripts were coded and personal identifying details was not collected.

4.11 Dissemination plan

After approval from Jimma University, the findings of the study will be disseminated to all relevant stakeholders through presentation. Copies of the research will be given to Jimma University, College of Health sciences and Medicine, department of Internal Medicine.Effort

will be made to publish in peer reviewed journals for a wider dissemination of the research impacts.

4.12 Operational Definition's

Dyspepsia: - if an individual has one of these symptoms, epigastric pain, postprandial fullness nausea, vomiting and early satiety.

Adults: -Those individuals who are older than 18years old

Rural: -Individuals who came from geographic area located outside towns and cities.

Urban: -Individuals who came from area-related to towns and cities.

Unprotected surface water: Drinking water source from lake, river, spring and well.

Protected/Piped tap water: - water source which is treated and used for drinking like pipe tap water and bottled water.

CHAPTER FIVE: RESULT AND DISCUSSION

5.1 RESULT

5.1.1 Sociodemographic characteristics of study participants

A total of 306 respondents (158 males and 148 females) participated in the study; the mean age at interview was 34.7±13.13 with age range of 18-70 years old. Majority of the participants, 266 (85.9%), were younger than 50 years of age. About 72(23.5%) participant of the study did not have formal education and 75(24.5%) completed tertiary education. One hundred forty-seven(48%) of the patients were rural residents. The socio-demographic characteristic of study participants is summarized in Table1.

One hundred sixty-three of the study participants were *H. pylori* seropositive, giving an overall prevalence of 53.3%. Eighty-five (53.8%) of male and 78 (47.9%) of female patients were positive for *H. pylori* and there was no statistically significant difference in the prevalence of *H. pylori* with respect to gender (Table 1).The seroprevalence of *H. pylori* increased with age with the highest peak in age 21-30 years old (Figure 2). There was statistically significant difference in the prevalence of *H. pylori* among age groups (p=0.003) (Table 6).However, there was no statistically significant difference in the prevalence of *H. pylori* with reference to residence (Table 1).

The seroprevalence of *H. pylori* was higher (58.8%) in those participants who used unprotected surface water than those who used piped tap water (48.8%). A seroprevalence of *H. pylori* was higher among those who ate raw vegetables always (72.5%) than those who rarely ate it (44%).There is statistically significant association of *H. pylori* seroprevalence and taking raw vegetables(p=.00). Increased seroprevalence was obtained among the patients who had no habit of hand washing after and before meal (70.7%) compared to those who had habit (37.1%) (Table 2).

There was statistically significant difference in prevalence of *H. pylori* seroprevalence among those who wash their hands before and after meal (p= 0.00) (Table 2). Study participants who had no awareness of communicability of *H. pylori* had higher prevalence(58.3%) than who had awareness(5.5%) (Table 3).Sharing cup/glass had 2.7 times higher risk of developing *H. pylori* infection(95% CI(1.692-4.562) (Table 5). Study subjects who depend on untapped drinking water sources are 2.48 times more exposed to *H. pylori* than those who use piped water. Study participants who had ≥ 4 family number had 1. 9 times higher risk of developing

H. pylori infection (AOR, 1.9; CI, 1.033-3.617; p=0.039), when compare to family size ≤4. (Table 6)

Table 1: *Sociodemographic characteristics of* H. Pylori *seropositivity among adult patients visiting Jimma University medical center in outpatient department, Southwest Ethiopia from July 30-August 11, 2018*

Variables	***N (%)***	***H. Pylori Serology***	
		Positive	**Negative**
Age (Mean ±SD)	34.7±13.13	39.79±13.8	28.8±9.45
Sex, N (%)			
Male	158 (51.6)	85(53.8)	73(46.2)
Female	148(48.4)	78(52.7)	70(47.3)
Religion, N (%)			
Orthodox	110(35.9)	53(48.2)	57(51.8)
Protestant	50(16.3)	18(36.0)	32(64.0)
Muslim	136(44.4)	87(64.0)	49(36.0)
Others	10(3.3)	5(50.0)	5(50.0)
Marital status, N (%)			
Single	104(34.0)	41(39.4)	63(60.6)
Married	183(59.8)	113(61.7)	70(38.3)
Divorced	17(5.6)	8(47.1)	9(52.9)
Widowed	2(.7)	1(50.0)	1(50.0)
Educational attainment, N (%)			
No formal education	72(23.5)	46(64.0)	26(36.0)
Primary completed	78(25.5)	47(60.3)	31(39.7)
Secondary completed	81(26.5)	33(40.7)	48(59.3)
Tertiary completed	75(24.5)	37(49.3)	38(50.7)
Family size, N (%)			
≤4	179(58.5)	69(38.5)	110(61.5)
≥4	127(41.5)	94(57.7)	33(23.1)
Residence, N (%)			
Urban	159(52)	66(41.5)	93(58.5)
Rural	147(48)	97(66.0)	50(34.0)
Occupation, N (%)			
Civil servant	118(38.6)	63(53.4)	55(46.6)
Student	54(17.6)	17(31.5)	37(68.5)
Farmer	65(21.2)	51(78.5)	14(21.5)
Unemployed	55(18.0)	28(50.9)	27(49.1)
Others	14(4.6)	4(28.6)	10(71.4)

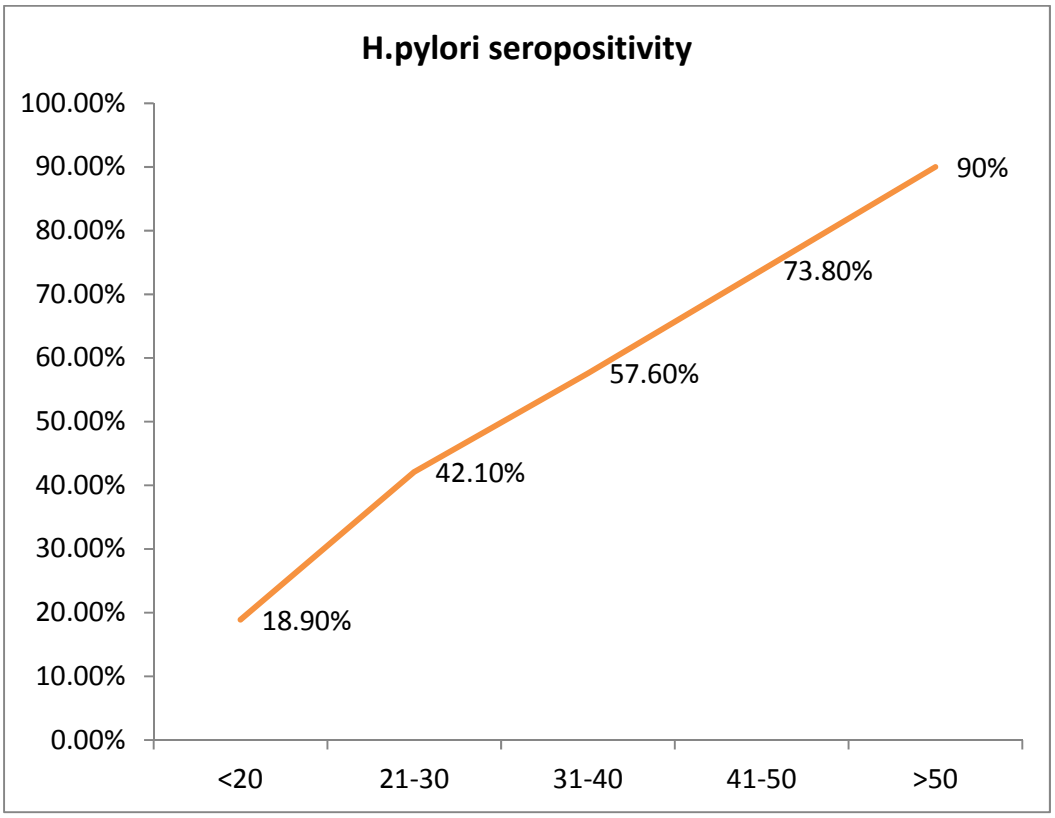

Figure 2: Frequency distribution of H pylori seropositivity with age among adult patients visiting Jimma University medical center in outpatient department, Southwest Ethiopia from July 30-August 11, 2018

5.1. 2 Environmental sanitation and Behavioral characteristics

Table 2: Sero-prevalence of *H. Pylori* infection with respect to Environmental sanitation and Behavioral among adult patients visiting Jimma University medical center in outpatient department, Southwest Ethiopia from July 30, 2018-August 11, 2018

Variables	N (%)	H. Pylori		P-value
		Positive (%)	Negative (%)	
How often do you eat raw vegetables in a week				
Always	109 (35.6)	79(72.5)	30(27.5)	.000
Occasionally	100 (32.7)	50(50)	50(50)	
Rarely	53 (17.3)	27(50.9)	26(49.1)	
Never	44 (14.4)	7(15.9)	37(84.1)	
How often do you add salt in your food				
Always	99(32.4)	45(45.5)	54(54.5)	.058
Occasionally	207(67.6)	118(57.0)	89(43.0)	
How often do you brush your teeth in a day				
Once	163(53.3)	92(56.4)	71(43.6)	.068
Twice	53(17.3)	27(50.9)	26(49.1)	
After every meal	9(2.9)	5(55.6)	4(44.4)	
Never/rarely	81(26.5)	39(48.1)	42(51.9)	
Do you share your teeth brush?				
Yes	32(10.5)	18(56.3)	14(43.7)	.062
No	193(63.1)	106(54.9)	87(45.1)	
How often do you take a bath or shower in a week?				
Once per week	193 (63.1)	113(58.5)	80(41.5)	.032
Twice per week	85(27.8)	38(44.7)	47(55.3)	
Every day	21(6.9)	7(33.3)	4(66.7)	
Others	7(2.3)	5(71.4)	2(28.6)	
Do you share cup /glass to drink				
Yes	207(67.6)	127(61.4)	80(38.6)	.000
No	99(32.4)	36(36.4)	63(63.6)	
Do you share dish/bowl with family members				
Yes	200(65.4)	115(57.5)	85(42.5)	.03
No	106(34.6)	48(45.3)	58(54.7)	
Hand washing habit After using the washroom/toilet				
Always	130(42.5)	42(37.1)	88(67.7)	.000
Never/rarely	176(57.5)	121(68.8)	55(31.2)	
Hand washing habit After and before meal				
Always	159(52.0)	59 (37.1)	100(62.9)	.000
Never/rarely	147(48.0)	104(70.7)	43 (29.3)	
Hand washing habit Before preparing food				
Always	132(43.1)	46(34.8)	86(65.2)	.000
Never/rarely	174(56.9)	117(67.2)	57(32.8)	
Cigarette/Gaya smoking				
Yes	41(13.4)	26(63.4)	15(36.6)	.162
No	265(86.6)	137(51.7)	128(48.3)	
Do you share Cigarette/Gaya with others				
Yes	26(8.5)	16(61.5)	10(38.5)	.170
No	15(4.9)	11(73.3)	4(26.7)	
Alcohol consumption				
Yes	75(24.5)	46(61.3%)	29(38.7)	.107
No	231(75.5)	117(50.6)	114(49.4)	
Contact with animals				
Yes	**59(19.3)**	38(64.4)	21(35.6)	.056
No	**247(80.7)**	125(50.6)	122(49.4)	
Sources of drinking water				
Unprotected surface water	**136(44.4)**	80(58.8)	56(41.2)	.003
Protected/tap water	**170(55.6)**	83(48.8)	87(51.2)	
Problem with mice				
Yes	**61(19.9)**	28(45.9)	33(54.1)	.198
No	**245(80.1)**	135(55.1)	110(44.9)	
Problem with waste disposal system				
Yes	**130(42.5)**	82(63.1)	48(36.9)	.003
No	**176(57.5)**	81(46.0)	95(54.0)	
Attending feasts?				
Yes	**195(63.7)**	106(54.4)	89(45.6)	.612
No	**111(36.3)**	57(51.4)	54(48.6)	

5.1.3 Awareness level and Exposure status of *H Pylori* Infection

Table 3: Awareness and exposure status of *H pylori* infection among adult patients visiting Jimma University medical center in outpatient department, Southwest Ethiopia from July 30,-August 11, 2018

Variables	**N (%)**	**H. Pylori**	
		Positive	**Negative**
Have you ever heard about H Pylori Infection			
Yes	43	21(48.9)	22(51.1)
No	263	142(54.0)	121(46.0)
If yes, source of information			
TV/Radio	19	10(52.6)	9(47.4)
Newspapers magazine	4	3(75.0)	1(25.0)
Family members	11	3(27.3)	8(72.7)
Friends	3	3(100)	0(0)
Others	6	2(33.3)	4(76.7)
Perceived communicability of H pylori			
Yes	13	9(69.2)	4(30.8)
No	175	95(54.3)	80(45.7)
Unsure	118	59(50.0)	59(50.0)
Family members diagnosed with H-pylori?			
Yes	30	18(60.0)	12(40.0)
No	151	77(51.0)	74(49.0)
Unsure	125	68(54.4)	57(45.6)
Have you ever been tested for H pylori?			
Yes	30	16(53.3)	14(46.7)
No	230	125(54.4)	105(45.6)
Unsure	46	22(47.9)	24(52.1)
Difficulty of swallowing solid food			
Yes	38	24(63.2)	14(36.8)
No	268	139(51.9)	129(48.1)
Weight loss more than 10% from your normal weight			
Yes	40	25(62.5)	15(37.5)
No	266	138(51.9)	128(48.1)
Recurrent vomiting			
Yes	51	34(66.7)	17(33.3)
No	255	129(50.6)	126(49.4)
Dyspepsia			
Yes	131	58(44.3)	73(55.7)
No	175	105(60.0)	70(40.0)

Table 4: Bivariate analysis of Candidate factors associated with H pylori infection among adult patients visiting Jimma University Medical Center in outpatient department, southwest Ethiopia from July 30,-August 11, 2018

Variables	H. Pylori		OR(95% CI)	P-Value
	Positive (%)	Negative (%)		
Educational status				
No formal education	46(63.9)	26(36.1%)	1.167(.603-2.260)	.647
Primary completed	47(60.3)	31(39.7)	2.573 (1.338-4.949)	.005
Secondary completed	33(40.7)	48(59.3)	1.817 (.939-3.517)	.076
Tertiary completed	37(49.3)	38(50.7)	1	
Family size				
≤4	69(38.5)	110(61.5)	4.54(2.760-7.471)	.000
≥4	94(74.0)	33(26.0)	1	
Residence				
Urban	66(41.5)	93(58.5)	2.734 (1.718-4.351)	.000
Rural	97(66.0)	50(34.0)	1	
Occupation				
Civil servant	63(53.4)	55(46.6)	.349 (.104-1.176)	.090
Student	17(31.5)	37(68.5)	.871 (.239-3.175)	.834
Farmer	51(78.5)	14(21.5)	.110 (030-.404)	.001
Unemployed	28(50.9)	27(49.1)	.386 (.108-1.379)	.143
Others	4(28.6)	10(71.4)	1	
Eating Raw vegetables' habit				
Always	79(72.5)	30(27.5)	.072 (.029-.179)	.000
Occasionally	50(50.0)	50(50.0)	.189 (.077-.464)	.000
Rarely	27(50.9)	26(49.1)	.182 (.069-.481)	.001
Never	7(15.9)	37(84.1)	1	
Salt consumption				
Yes	45(45.5)	54(54.5)	1.591(.983-2.576)	.059
No	118(57.0)	89(43.0)	1	
Shower taking habit				
One	113(58.5)	80(41.5)	1.747 (1.044-2.923)	.034
Twice	38(44.7)	47(55.3)	2.825 (1.091-7.315)	.032
Every day	7(33.3)	14(66.7)	.565 (.107-2.985)	.501
Others	5(71.4)	2(28.6)	1	
Sharing cup /glass to drink				
Yes	127(61.4)	80(38.6)	2.778 (1.692-4.562)	.000
No	36(36.4)	63(63.6)	1	
Sharing dish/bowl				
Yes	115(57.5)	85(42.5)	1.635(1.017-2.627)	.042
No	48(45.3)	58(54.7)	1	
Hand washing habit After using the washroom/toilet				
Always	42(32.3)	88(67.7)	4.6(2.834-7.498)	.000
Never/rarely	121(68.8)	55(31.2)	1	
Hand washing habit After and before meal				
Always	59(37.1)	100(62.9)	4.1(2.538-6.621)	.000
Never/rarely	104(70.7)	43(29.3)	1	
Hand washing habit Before preparing food				
Always	46(34.8)	86(65.2)	3.84(2.380-6.189)	.000
Never/rarely	117(67.2)	57(32.8)	1	
Cigarettes smoking				
Yes	26(63.4)	15(36.6)	.617(0.31-1.218)	.617
No	137(51.7)	128(48.3)	1	
Source of drinking water				
Unprotected surface water	80(58.8)	56(41.2)	.668(.424-1.053)	.003
Protected/tap water	83(48.8)	87(51.2)	1	
Recurrent vomiting				
Yes	34(66.7)	17(33.3)	.512 (.272-.963)	.038
No	129(50.6)	126(49.4)	1	
Dyspepsia during hospital visit				
Yes	58(44.3)	73(55.7)	1.9(1.193-2.986)	.007
No	105(60.0)	70(40.0)	1	

5.1.4 Multivariate Logistic Regression Model Analysis for *H. Pylori* Infection Risk factors

All variables which had shown statistically significant association during the bivariate analysis at P-value below 0.25 entered to multivariable analysis. Each independent variable was tested against dependent variable by bivariate analysis its OR ratio was calculated. Finally, variables that were found statistically significant under bivariate analysis was entered into multiple logistic regression models and adjusted odds ratio was calculated for each exposure variables to see the effect of the independent variables on the dependent variable (*H pylor*i seropositivity) by controlling for confounders. Among variable that were found significantly associated with *H. pylori* infection as shown in the table below were: Age at interview, family size, frequency of raw vegetables consumption, hand washing habit after using toilet, Source of drinking water, and sharing cup/glass (Table 6).

Table 5: Multivariate analysis of factors associated with *H pylori* infection among adult patients visiting Jimma University medical center in outpatient department, Southwest Ethiopia from July 30 -August 11, 2018

Variables	H. Pylori		AOR(95% CI)	P-Value
	Positive (%)	Negative (%)		
Age (Mean ±SD)	39.79±13.8	28.8±9.45		
≤ 20	7(18.9)	30(81.1)	12.013(3.150-38.343)	.001
21-30	51(42.1)	70(57.9)	6.916(1.927-24.826)	.003
31-40	38(57.6)	28(42.4)	4.296(1.171-15.762)	.028
41-50	31(73.8)	11(26.2)	2.339 (.594-9.212)	.224
≥50	36(90.0)	4(10.0)	1	
Family size				
≤4	69(38.5)	110(61.5)	1	
≥4	94(74.0)	33(26.0)	1.9(1.033-3.617)	.039
Eating Raw vegetables' habit				
Always	79(72.5)	30(27.5)	3.012 (1.671-5.429)	.000
Occasionally	50(50.0)	50(50.0)	2.874 (1.426-5.794)	.000
Rarely	27(50.9)	26(49.1)	3.479 (1.559-7.765)	.003
Never	7(15.9)	37(84.1)	8.840(3.13124.957)	.002
Sharing cup /glass				
Yes	127(61.4)	80(38.6)	.303 (.156-.586)	.000
No	36(36.4)	63(63.6)	1	
Hand washing habit After using the washroom/toilet				
Always	42(25.8)	88(61.5)	2.729 (1.316-5.659)	.000
Never/rarely	121(74.2)	55(38.5)	1	
Sources of drinking water				
Unprotected/ surface water	80(58.8)	56(41.2)	2.480 (1.231-4.995)	.040
Protected/tap water	83(48.8)	87(51.2)	1	

CI: Confidence interval; AOR: adjusted odds; 1*Reference

5.2 DISCUSSIONS

In the present study, we found that the total seroprevalence of H. pylori was 53.3%.This is lower when compared with the highest prevalence in Nigeria (87.7%) and low prevalence was Switzerland (18.9%)(2). This finding was higher when compared to study done in Desse referral hospital (24.3%), Ethiopia(30).

Regarding the age of the study participants, there are conflicting reports on the relationship between age of patients and prevalence of *H. pylori*. Different Studies suggests that the prevalence of H. pylori increased with age (31-33). In this study there was an increase in the prevalence of H. pylori with age and statistically significant association was found between age and prevalence of H. pylori infection.

Associated factors for H. pylori infection including family size and lifestyle have been reported in a number of previous studies (31, 34). According to the present study, there was significant association occurring with the family size and H pylori infection. Study participants who had ≥ 4 family number had 1. 9times higher risk of developing H. pylori infection (AOR, 1.9; CI, 1.033-3.617; p=0.039), when compare to family size ≤4. This finding was consistent with study done in West Cameroon and Northwest Ethiopia (30, 34)

H. pylori infection is also be related to food and eating habits.There is strong association between the frequency of eating raw vegetables and H. pylori infection;study participants who eat raw vegetables more frequently were 3.0 higher risk (AOR, 3.012; CI, 1.671-5.429; p=0.00)when compare to those who rarely/never eat raw vegetables/ fruits. This finding was similar with study done China, Cameroon and South Ethiopia (35).The current study showed significant association between *H. pylori* infection and raw fruits and vegetables consumption which is consistent with previous studies(36).

In this study, sharing cup/glass has been shown to be related to H pylori infection. Studysubjects who did not share drinking cup/glass with others reduces risk for H pylori infection by 97% (AOR, 0.303; CI, (.156-.586; p=0.00). This finding was similar with other studies (37) .

Hand washing habit after using the washroom/toilet significantly associated with H pylori infection. Study subjects who didn't wash their hands after toilet had the risk of H pylori infection increases by 2.7 times compare with those who wash their hands always (AOR, 2.7; CI, 1.316-5.; p=0.00). This finding was consistent other similar studies (29, 37).

The source of drinking water has a strong effect on the prevalence of H. pylori infection. Water supply is an important source of H. pylori infection in families with high or low social economic levels. In this study source of drinking water had significant association with H pylori infection. Study subjects with Drinking Water Source unprotected /surface had2.5 times higher risk of H pylori infection when compare to those who drinking tap/bottled water always (AOR, 2.48; CI, 1.231-4.995.; p=0.00). This was consistent with the report from Cameroon and Ethiopia (37, 38).

5.3 Conclusion and Recommendation

In conclusion, the seroprevalence of *H. pylori* was high andsome associated factors have been identified. Significant associationwas observed between *H. pylori* seropositivity and age, family size, eating raw vegetables and fruits, hand hygiene practices of study participants, and sources of drinking water.However, itwas not related to sex, alcohol or tobacco consumption. Even though, the absence of association in this study might be due to less number of alcohol users, the type and amount of alcohol consumed has no effect on the association. The burden of H-pylori infection that was found in our results concerns the need to design and apply intervention measures that can reduce the transmission and thus decrease the clinical consequences of the infection. Further large scale community based studies are recommended to better characterize risk factors*H. pylori* of the infection.

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ANNEX II CONSENT FORM

Jimma University College of Public Health and Medical Sciences, Jimma University

Questionnaire for assessing prevalence and risk factors of H-Pylori infection among adult patients in OPD at JUMC

A). INFORMATION TO THE PARTICIPANT

Interview code no _____

Greeting and self-introduction and consent

Greeting: - Good morning/afternoon.

My name is Dr. Zekarias Desalegn.We are conducting a scientific research on prevalence and risk factors of H-pylori infection among adult patients seen in OPD at JUMC. Therefore, I am happy to inform you that you are one of the potential participants in this study. Your participation is only determined by you. If you feel you will not participate in this study, your decision will be much respected from the outset. It is only if you are willing I will proceed to ask you some information.

Data will be collected with interview and venous blood sample will be taken. By participating in this research project you may feel some discomfort in wasting your time. However, your participation is definitely important in determining the serostatus and identifying the factors that are associated with H-Pylori infection that will be helpful for your health. The interview may take 30 minutes and the information gathered will be used for writing a research for partial fulfilment of a specialty certificate in Internal Medicine at Jimma University.

Here, I want to assure you that any information obtained from you will remain confidential and even there is no need of writing your names or any personally identifiable information.

B) CERTIFICATE OF CONSENT

Do you wish to participate in the study? Yes/No

If the participant agrees to participate in the study, let him/her to sign consent and proceed with interview.

I have adequate information about the research and I have decided to participate in the study.

Signature ----------

If the participant says “No, I don’t want to participate in the study”, thank him (her) and stop.

Thank you!

Name of interviewer_____

Date_____/_____/____

Afaan Oromoo

Oddeffanoo Qoratamaaf kenamu

Ani Dr. Zakaariyaas Dasaalany yoon ta'u,Karora barrefama eebbaa irrati hirmaataa akka naaf taatan kabajaan isin gaafadha. Qorannoon kan adeemsiifamu gaaffiifi meeshaa ittin onne ilaalaniin yoo ta'u , rakkoon tokkoyuu isiiniti hin gahu. Siree irrati gara bitaati garagaltani eega ciistan booda meeshaa onnee itti qorattaniti laalamtu. Qorrannoon kun deqiiqaa 30 fudhata. Ooddeffanoon qorranoo kanarraa argamu hoojjii fundurraaf adeemsamuuf gargaarsa guddaa kenna. Qorrannoo keessaa yeroo barbaadaniti bahuun kan danda'amu yoo ta'u, kuni immo tajaajila isiinii keennamu irrati dhiibbaa hoommayyu hin qabu.

II) Mallattoo Mirkanessaa

Qo'anna irrati qooda fudhachuuf yoo waligaltan bakka armaan gaddii irrati mallatton mirkenessa.

Galatoomaa

Mallattoo---------

Maqaa–Qorrata goodhuu ----------

Guyyaa----------

Yoo qo'anna irrati qooda fudachuu hin barbaadne taanan, Isaan geleteessaati dhiisaa

In Amharic

ለተሳታፊው የሚሰጥ የጥናት ውል ማስገንዘብያ

እኔ ዶ/ር የተባልኩ የውስጥ ደዌ ህክምና ት/ት ክፍል የመጨረሻ አመት ሬዚደንት የመመረቂያ ፁሁፌን ለመስራት ለሚያስፈልገኝ ጥናት ርስዎ መመረጥዎን ሳሳውቅዎት በታላቅ ደስታ ነው::

ጥናቱ የሚካሂደው በቃለ መጠይቅ መሳሪያ አናጥቂትየደምናሙናበመውሰድ ሲሆን በርሶ ላይ ምንም አይነት ጉዳት አይደርስም:: ጥናቱ እስከ 30:00 ደቂቃ ይፈጃል ::

ከጥናቱ መውጣት ከፈለጉ በማንኛውም ሰዓት አቋርጠው መውጣት ይችላሉ:: ይህም በማድረግዎ ምንም ተጽኖ አይደርስብዎትም::

ከጥናቱ የሚገኘው ውጤት ወደፊት የሚካሂዱ ሌሎች ጥናቶች መነሻ ከመሆኑም ባሻገር የተፈለገው ጥናት በዘናችን ምን ንደሚመስል ያስገነዝባል::

የርሶ ስምና ሊሎች የርሶን ማንነት የሚያመለክቱ ነገሮች በጥናቱ ላይ አይገቡም::

አመሰግናለሁ

- **የተሳታፊው ፍቃደኝነት ማረጋገጫ ቅፅ**

ስለጥናቱ በቂ ውቀት ስላገኘሁ በሙሉፍቃዲ ለመሳተፍወስኛለሁ::

ፊርማ ___

ተሳታፊው በጥናቱ ለመሳተፍ ካልፈለገ አመስግነው ያሰናብቷቸው::

የተጠያቂው ሰም ----------

ቀን----------

Annex III: Questionnaire

Questionnaire to assess Seroprevalence and risk factors of H-pylori infection in adult patients visiting Jimma University Medical Centre in outpatient department.

Medical Registration Number __ __ __ __ __ __

I. Socio-demographic profile

1. Age: _____ (years)
2. Sex: 1 Male 2 Female

3.Religion: 1. Orthodox Christian □3 Protestant Christian □ Muslim
□ Others (specify)_____

4.Marital status: 1. single 2.married 3.divorced 4. widowed/widower

5.Educational attainment: 1.No formal education 2.primary completed
3.secondary completed 4.Tertiary completed

6.Family size:_____

7.Residence: 1.Urban 2. Rural

8.Occupation: 1.Civil servant 2.Student 3. Farmer 4. Unemployed
5. Others (specify)_____

II. We'll now move on to some questions about your diet.

9.How often do you take raw vegetables in a week?

1.always 2.occasionaly 3.rarely 4.never

10.Do you add salt to prepared food once your meal is on table?

1. Yes
2. No

11.How often do you usually brush your teeth? Check one.

1. Once per day
2. Twice per day
3. After every meal

12.Do you share a toothbrush?

1. □Yes → please indicate the number of people who also use this toothbrush: _____
2. □No

13. How often do you usually take a bath or shower? Check one

1. ▢Once per week
2. ▢Twice per week
3. ▢ Every day
4. ▢Others

14.Do you share a cup or glass that others are also drinking from?

1. Yes 2. No

15.Do you share a dish or bowl that others are also eating from?

1. Yes2. No

16. Do you wash your hands after toilet?

1. yes 2. No

17..Do you wash your hands after and before meal?

1.yes 2.No

18..Do you wash your hands before food preparation?

1.yes 2.No

19.Do you smoke cigarettes?

1. Yes
2. No

20.If yes for Q 19Do you ever smoke anything that you share with other people? E.g., cigarette or ቧያ.

1. Yes 2. No

21.Do you drink alcohol? 2. Protected/tap water

1.Yes 2.No

22.Do you live together with cattles or other animals?

1. Yes 2. No

23.Where does your household usually get **drinking** water?

1. Unprotected source of water

24.Do you ever have problems with mice getting in your house or have you seen their droppings?

1. Yes 2. No

25. DO you have problems with water or sewage in your house?

1. Yes 2. No

26. Have you attended feasts (ድግስ) in the last 6 months?

1. YES 2.No

III. Health questions for dyspepsia and H. pylori infection

27.Have you heard of Helicobacter pylori or H. pylori infection?

1. Yes
2. No

28.If yes, for Q 27 How did you first find out about H. pylori infection? Don't read out options. Mark all that apply.

1. ▢TV/Radio
2. ▢Newspapers/magazines
3. ▢Nurse/Doctor told me
4. ▢School
5. ▢Had it myself
6. ▢Family members who had it
7. ▢Friends who had it
8. ▢Other; specify: _____

29.Do you know or have an idea about how people get it?

1. Yes
2. No

30.Are you worried about how H.pylori infection might affect the health of others?

1.yes 2. No

31.Have you ever seen a nurse or Doctor about stomach or esophagus (for symptoms of dyspepsia)?1.yes 2.No

32.Have you ever been tested for H. pylori, before this research project?

1. Yes

2. No

33.If yes for Q30 ask questions

a. What kind of test did you have for H. pylori? Mark all that apply.

1. ▢Breath test
2. ▢Blood test
3. ▢Gastroscopy (endoscopy)
4. ▢Stool examination
5. ▢Other test; specify test: _____
6. Unsure / don't remember

34.Do you have difficulty swallowing solid food?

1. Yes 2. No

35.Do you have unexplained weight loss? More than 10% of your normal weight.

1. Yes 2. No

36.Do you have recurrent vomiting?

1. Yes 2. No

We would now like to know about any stomach problems you may have had in the past 6 months. Use the scale below to indicate the severity of your symptoms lasting longer than 3 months.

1. No problem
2. Minimal problem (can be easily ignored without effort)
3. Mild problem (can be ignored with effort)
4. Moderate problem (cannot be ignored but generally does not limit my daily activities)
5. Moderately severe problem (cannot be ignored and occasionally limits my daily activities)
6. Severe problem (cannot be ignored and often limits my daily activities)
7. Very severe problem (cannot be ignored and markedly limits my daily activities and often requires rest)

	1	2	3	4	5	6	7
35.Upper abdominal symptoms, overall	▢	▢	▢	▢	▢	▢	▢
1.Epigastric, middle of abdomen just below breast bone, pain or unpleasant sensation	▢	▢	▢	▢	▢	▢	▢
2.Epigastric discomfort	▢	▢	▢	▢	▢	▢	▢
3.Epigastric burning	▢	▢	▢	▢	▢	▢	▢
4.Feeling full too long	▢	▢	▢	▢	▢	▢	▢
5.Feeling full even though you ate a small amount	▢	▢	▢	▢	▢	▢	▢
6.Heartburn, burning sensation under the lower part of the centre of the chest which rises towards or into the neck	▢	▢	▢	▢	▢	▢	▢
7.Acid regurgitation, backward flow or sour or bitter fluid from the stomach into the food pipe	▢	▢	▢	▢	▢	▢	▢
8.Upper abdominal bloating	▢	▢	▢	▢	▢	▢	▢
9.Excessive belching	▢	▢	▢	▢	▢	▢	▢
10.Nausea	▢	▢	▢	▢	▢	▢	▢

IV.**Laboratory result**

36.H. pylori serology

1. Positive 2. Negative 3. Not done

Thank you!

Data collected by:_____Signature_____Date_____

Checked by: _____ Signature_____ Date_____

I.Halla tatewan hawasuma

1. Umri _____ (wagga)
2. sala 1 .dhirra 2. dhalla
3. Amantii: 1. Ortodoksi 2. protestanti3. muslima
   4.kan biro yoo jiraate (ibsi)_____
4. halla fudha fi heruma: 1. Kan hin fune 2. Kan fudhe 3. Kan wal hikan 4. Kan harka du"e
5. sadarka barumsa 1. Kan hin barane2. Sadarka tokkoffa kan xumure/te 3. sadarka lammaffa kan xumure/te 4.barnota sadarka olana kan xumure/te
6. halla bayina mati:_____
7. iddo jirenya : 1. maggala 2.badiyaa
8. halla hoji: 1. Hojeta motumma 2. barrata 3. Qonan bulla 4. Hoji dhaba/du
   5.kan biro yoo jirate (ibsi)_____

II.Amma halla sirna nyatta gaaffachuti tarra

9. Torbaniti nyata dhedhi kaneen akka fudura fi kuduralee ta'an yero hangaam fayadamta?
   1. Yero hunda 2.akkuma argadheti3. Tare tare 4. Gonkuma hin fayyadamu
10. nyata yommu qopesitu sogida ni fayadamta?
    1. Eye
    2.lakki
11. ilkkan kee yero hangam hangamin qulqulefata?
    1. Guyyan al takka
    2. Guyyan al lamma
    3. Nyatan boda
12. mesha ilkkan kee ittin qulqulefatu nama birof ni keenita?
    1. Eye→nama meqaf ----------
    2. lakki

13.qama kee yero hangam hangamin dhiqata?

1. Torbaniti al tokko
2. Torbaniti al lamma
3. Guyya guyyan
4. Kan biro yoo jirate ibsi---------

14.Mesha wan gara gara ittin dhugdu kanen akka burcuqo fi kkf nama birof ni liqesita ykn ni kentia?

1.Eye 2. lakki

15.Meshale nyata kaneen akka sahani fi kkf nama birof ni liqesita ykn ni kentia?

1.Eye 2. lakki

16. mana fincani yogu debitu harka ni dhiqata?

1.Eye 2. lakki

17. nyata dura fi boda harkka kee ni' dhiqata?

1.Eye2. Lakki

18.nyata qopesun durra harkka kee ni dhiqata?

1.Eye 2. lakki

19.tambo\sigara ni arsita?

1.Eye 2. lakki

20 gaffi lakk 19 eye yoo ta'e. nama birof ni kentia?

1.Eye 2. lakki

21. dhugati alkoli gara gara ni dhugda?

1.Eye 2. lakki

22.beyladota mana wajjin jirrratu?

1.Eye 2. lakki

23.bishan dhugati manaf fayyadamtan essa argatu?

1. Bishan egumsi hin godhamnef irra
2. Bishan egumsi godhamef irra fkn bishan buanbua

24.mana jirenya kessan kessa rakkon hantutan wall qabte isin mudate jira ? fkn falti isatin wall qabate.

1.Eye 2. lakki

25. nanno mana jirenya kessanit bishan dhangalan wal qabate rakkon issin irra gahe jirra?

1.Eye 2. lakki

26. ji'ota jahan (6)darban kessa mana cidha fi kknf irrati himate bekta ?

1.Eye 2. Lakki

III.Halla fayuma fi bakteriya garachan wall qabate gaffiwan jliran

Health questions for dyspepsia and H. pylori infection

27.wa'e.bakteriya garacha dhgesani

Bektu?1.Eye 2. lakki

28.gaffi lakk 27 debbin eye yoo ta'e ‹‹mal irra ykn essa dhagessan?

1. TV ykn rediyo irra
2. Gazexa ykn masteti irra
3. Ogessota fayyarra
4.manen barnotarra
5.Offuma kiyyarra
6. warra kiyyarra
7. hiriyya kiyyarra
8. kan biro yoo jirate ibsi

29.dhukkubni namota akkamiti akka qabu bektu ykn wan dhagesan qabdu?

1.Eye 2. lakki

30.bakteriyan garracha namota birro irrati midha fiduf cinqqamtani bektu ?

1.Eye 2. lakki

31. wa'e rakko garrachan wall qabte dhufu irrati ogessa fayya marisiste bekta?

1.Eye 2. lakki

32.qoranoo kana dura bakteriya garrachan wal qabate qorano gotani bektu ?

1. Eye 2. lakki

33.gaffi lakk 30 debin kee Eye yoo ta'e

υ.qorano akkami gotani bektu ?

1. Qoranno Afurra
2. Qoranno dhiga
3. Qoranno mesha Indoskopi
4. Qoranno sagara
5. Hin yadadhu
6. Kan biro yoo jirate ibsi

34.nyaata jajabata ta'an yemu nyaatan liqimsu irrati ni rakkatu ?

1. Eye 2. lakki

35. hir'ini qama hin egamne isin mudate bekka ?10%

1. Eye 2. lakki

More than 10% of your normal weight.

36.haqee ykn debisisun irra dadebin isin mudate bekka?

1. Eye 2. Lakki

Ji'otan jahan (6) darabanif rakkina garracha kammiyuu bekkuf kan itti fufu kana gochu nan barbada.safartuwwan kana gaditi ibsaman ergawan cicimo kan qaban yoo ta'u rakkon ji'a sadi (3) ol ta'u argisisa.

1. **Rakkon hin jiru**
2. **Rakko bay'e xiqon ni jirra**
3. **Rakko xiqotu jirra**
4. **Rakko gidu gallesatu jirra**
5. **Rakko gidu galessa olitu jira**
6. **Rakko cimatu jirra**
7. **Rakko bay'e cimatu jirra**

	1	2	3	4	5	6	7
37.mallato garracha issa ol'ana..	▢	▢	▢	▢	▢	▢	▢
1. garracha issa giddu ykn harma irra xiqo gadi siqe dhukubu ykn waransa.	▢	▢	▢	▢	▢	▢	▢
2. mirri garrin dhagahamu dhabu gara.	▢	▢	▢	▢	▢	▢	▢
3.gubba gara.	▢	▢	▢	▢	▢	▢	▢
4. yero dheraf gara afufun jira.. .	▢	▢	▢	▢	▢	▢	▢
5.xiqoma akka nyatanini gara akka nama qufeti afufun jira.	▢	▢	▢	▢	▢	▢	▢

6.guba onne ykn guba gidu onnetin gar mormati ol dhibun isiniti ni dhagahama	▢	▢	▢	▢	▢	▢	▢
7.waan akka asidiiti nama gubu ol debisisun ykn waan hadhaya ta'e ykn kurawa ta'e isin debisisun jirra.	▢	▢	▢	▢	▢	▢	▢
8.garracha issa ol'ana afufun jira.	▢	▢	▢	▢	▢	▢	▢
9.di'u gar malle issin di'achisun jirra.	▢	▢	▢	▢	▢	▢	▢
10 ol ol jechun jira.	▢	▢	▢	▢	▢	▢	▢

IV Bu'awan labratori

38. seroloji bakteriya garracha .

1. posativ
2. nagetive
3. hin lalamne

Galatooma!

Abba data sasabe ..... mallato ..... guyya .....

Kan mirkanesu ..... mallato..... guyya.....

I.ስነ- ማህበራዊ ኩነታዎች

1. እድሜ _____ (ዓመት)
2. ፆታ 1 .ወንድ 2. ሴት
3. ሀይማኖት:1. ኦርቶዶክስ ክርስትያን 2. ፕሮቴስታንት ክርስትያን 3.መስሊም
   4.ሌሎች (ጥቀስ)_____
4. የጋብቻ ሁኔታ: 1. ያላገባ 2. ያገባ 3. የተፋታ 4. የሞተበት/ባት
5. የትምህርት ደረጃ: 1. መደበኛ ት/ት ያልተማረ 2. አንደኛ ደረጃ ያጠናቀቀ
3. ሁለተኛ ደረጃ ያጠናቀቀ 4. ከፍተኛ ትምህርት ያጠናቀቀ
6. የቤተሰብ መጠን:_____
7. የመኖሪያ አካባቢ: 1. ከተማ 2. ገጠር
8. የስራ ሁኔታ: 1. የመንግስት ሰራተኛ 2. ተማሪ 3. አርሶ አደር 4. ስራ አጥ
5. ሌሎች(ጥቀስ)_____

II.አሁን ስለአመጋገብ ሁኔታዎችን የተወሰኑ ጥያቄዎችን ለመጠየቅ እንሄዳለን

9. በሳምንት ምን ያህል ጥሬ አትክልቶችን ትጠቀማለህ/ለሽ?

   2. ሁልጊዜ 2.እንዳገኘሁት3. አልፎ አልፎ 4. በጭራሽ

10. ምግብ ስታዘጋጅ ጨው ትጠቀማለህ/ለሽ?

    1. አዎ
    2.አይ

11.በምን ያህል ጊዜ ጥርስህን ታፀዳለህ?

    1. በቀን አንዴ
    2. በቀን ሁለቴ
    3. ከምግብ በኋላ

12. የጥርስ ማጽጃህ ለሌላ ታውሳለህ/ለሽ?

    1. አዎ→ ለምን ያህል ሰው ----------
    2. አይ

13. በየ ምን ያህል ጊዜ ሰውነትህን ትጣጠባለህ/ለሽ?

    1. በሳምንት አንድ ጊዜ
    2. በሳምንት ሁለት ጊዜ

3. በየዕለቱ

4. ሌሎችም

14. መጠጫ ብርጭቆህ/ሺኒ ለሌላ ታውሳለህ/ለሽ?

3. አዎ 4. አይ

15. መመገቢያ ሳህን ለሌላ ሰው ታውሳለህ/ለሽ?

1.አዎ 2. አይ

16. ከመፀዳጃ መልስ እጅ ትታጠባለህ/ለሽ?

1.አዎ 2. አይ

17. ከምግብ በፊትና በኋላ እጅ ትታጠባለህ/ለሽ?

1.አዎ 2. አይ

18.ምግብ ከማዘጋጀት በፊት እጅ ትታጠባለህ/ለሽ?

1.አዎ 2. አይ

19. ሲጋራ ታጨሳለህ/ለሽ?

1.አዎ 2. አይ

20.የተራ ቁጥር 19 ጥያቄ መልስ አዎ ከሆነ፣ለሌላ ሰው ታጋራለህ/ለሽ?

1.አዎ 2. አይ

21.የአልኮልመጠጥ ትጠጣለ/ለሽ?

2. ጥበቃ ከተደረገለት የውሀ ምንጭ፡የቧንቧ ውሃ

1.አዎ 2. አይ

22.ከቤት እንስሳት ጋር አብረው ይኖራሉ?

1.አዎ 2. አይ

23.ለቤት መጠጥነት የሚውለውን ውሀ

ከየት ነው የሚገኙት?

1. ጥበቃ ካልተደረገለት የውሃ ምንጭ

24.በመኖሪያ ቤተሰ ውስጥ ከአይጥ ጋር በተያያዘ ወይም ከአይጦች ጋር የተነካካ ቆሻሻችግር አጋጥመዎት ያውቃል?

1.አዎ 2. አይ

25. መኖሪያ ቤተሰ አካባቢ ከውሀ ወይም ከቧንቧ ፍሳሽ ጋር ችግር አለ?

1.አዎ 2. አይ

26.ላለፉት 6 ወራትድግስ ላይ ተሳትፈው ያውቃሉ?

1.አዎ 2. አይ

IV. ከምግብ አለመፈጨትና እና ‹‹ H. Pylori ››ከተባለ ህዋስ ጋር የሚነሱ የጤና ጥያቄዎች

27.ስለ ‹‹ H. pylori ›› ማመርቀዝ ስምተህ ያውቃለህ?

1.አዎ 2. አይ

28.ለተራ ቁጥር 27 ጥያቄ መልስ አዎ ከሆነ ስለ ‹‹ H. Pylori ›› ማመርቀዝ ከምን ሰመ ፤አማራጭ ካላገኙ ሁሉንም ይምረጡ

1. ቲቭ ወይም ራዲዮ
2. ጋዜጣ ወይም መጽሄት
3. ሀኪም ወይም ነርስ ነግሮኛል
4. ትምህርት ቤት
5.እኔው እራሴ
6. ከቤተሰባችን አንዱ
7. ከጓደኛዬ
8. ከሌሎች

29.ሰዎች እንዴት እንደሚይዛቸው ታውቃለህ ወይም ሀሳቡ አለህ ?

1.አዎ 2. አይ

30.H.pylori የሌሎችን ጤና ሊጎዳ ይችላል ብለው ተጨቀው ያውቃሉ?

1.አዎ 2. አይ

31. ስለ ጨጓራ ወይም የምግብ ቧንቧ (ስለምግብ ያለመፈጨት ምልክቶች) ለሀኪም ወይም ለነርስ አማክረው ያውቃሉ?

1.አዎ 2. አይ

32. ከዚህ የምርምር ጥናት ፕሮጀክት በፊት ስለ H. pylori ተመርምረዋለን?

1. አዎ 2. አይ

33. ጥያቄ ተራ ቁጥር 30 ላይ መልሱ አዎ ከሆነ

ሀ. ምን አይነት ምርመራ አድርገዋል ? ያደረጉት ምርመረ ካለ ሁሉን ይክበቡ

1. የተንፋሽ ምርመራ
2. የደም ምርመራ
3. ኢንዶስኮፒ
4. የሰጋራ ምርመራ
5. ሌሎች ምርመራ ካለ ይጥቀሱ
6. እርግጠኛ ያልሆኑበት/ የማያስታውሱት

34.ጠጣር ምግቦችን ሲመገቡ ጉሮሮዎትን ይቸገራሉ ?1. አዎ 2. አይ

35. ያልተጠበቀ ክብደት መቀነስ አጋጥሞዎት ያውቃል?ከ10 % በላይ

1. አዎ 2. አይ

36.ተደጋጋሚ የሆነ ማስመለስ አጋጥሞዎታል?

1. አዎ 2. አይ

ላለፉት 6 ወራት ማንኛውም አይነት የጨጓራ ችግር ለማወቅ ሚከተለውን ለማድረግ እንወዳለን፡፡ ከዚህ በታች የተገለጹ መለኪያዎች የሚከተሉትን ጥብቅ ምልክቶች ከ3 ወር በላይ መቆየቱን ያመለክታል፡፡

1. **ችግር የለም**
2. **በጣም ዝቅተኛ ችግር አለ**
3. **ዝቅተኛ ችግር አለ**
4. **መካክለኛ ግር አለ**
5. **ከመካክለኛ የበለጠ ችግር አለ**
6. **ከፍተኛ ችግር አለ**
7. **በጣም ከፍተኛ ችግር**

	1	2	3	4	5	6	7
35. የላይኛው የሆድ ምልክት	▢	▢	▢	▢	▢	▢	▢
1..ኤፕጋስትሪክ፣ የማህልኛው ሆደ ከጡት ወረድ ብሎ ፣ህመም ወይም ሃይለኛ ውጋት	▢	▢	▢	▢	▢	▢	▢
2.የሆድምቾት አለመሰማት	▢	▢	▢	▢	▢	▢	▢
3.የሆድ ማቃጠል	▢	▢	▢	▢	▢	▢	▢

4.ለረጅም ጊዜ የሆድ መነፋት	▢	▢	▢	▢	▢	▢	▢
5.ትንሽ እንኳን ቢመገቡም ልክ እንደጠገቡ የሆድ መነፋት	▢	▢	▢	▢	▢	▢	▢
6.የልብ ማቃጠል፣ የማቃጠል ስሜት በደረት መሀልና የታችኛው ክፍል ወይም ወደ አንገት የመግፋት ስሜት	▢	▢	▢	▢	▢	▢	▢
7.አሲድ ማመንዘክ ፣ ማስመለስ ወይም መራራ ወይም ቆምጣጣ ፈሳሽ ከጨጓራ ወደ ምግብ ትቦ መመለስ	▢	▢	▢	▢	▢	▢	▢
8.የላይኛው የሆድ መነፋት	▢	▢	▢	▢	▢	▢	▢
9.ከመጠን በላይ ማስገሳት	▢	▢	▢	▢	▢	▢	▢
10 ማቅለሽለሽ .	▢	▢	▢	▢	▢	▢	▢

IV የቤተሙከራወጤት

36.”H. pylori” ሲሮሎጅ

1. ፖዝቲቭ

2. ነጊቲቭ

3. አልተደረገም

አመሰግናለሁ

መረጃ ስብስብ

በ፡-..... ፊርማ ..... ቀን.....

ያረጋገጠው

በ፡-..... ፊርማ ..... ቀን.....

Name and Signature of Advisors

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