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Burdens and Predictors of Helicobacter Pylori Infection in Southern Ethiopia; A Cross-Sectional Study

Kassahun Haile*, Temesgen Abera1

Department of Medical Laboratory Science, College of Medicine and Health Science, Wolkite University, Wolkite, Ethiopia

***Corresponding author:**
Kassahun Haile

kassahaile07@gmail.com

Tel: 25926074374

Department of Medical Laboratory Science, College of Medicine and Health Science, Wolkite University, Wolkite, Ethiopia

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Abstract

Background: Helicobacter pylori is one of the public health important bacteria that affected more than half of the global population. It is a primary cause of several gastrointestinal diseases and associated with the increased risk of developing gastric carcinoma. Determination of updated data on the burden of the infection and its predictors was important to plan and design effective intervention measures to prevent gastrointestinal complications and public health impacts. Hence, this study aimed to determine the prevalence of *H. pylori* infection and its predictors among dyspeptic patients attending Wolkite University specialized hospital from September to December, 2020.

Method and materials: A facility-based cross-sectional study was conducted among 316 dyspeptic patients who attending the hospital during the study periods. Socio-demographic and other related data were collected using structured questionnaires. Stool specimen was collected and *H. pylori* stool antigen was detected by Wondfo *H. pylori* test kit the data was entered and analyzed by using SPSS version 22. Binary logistic regression analysis was performed to identify predictors variables, where a p-value <0.05 was considered statistically significant.

Results: The overall prevalence of H. pylori infection detected by stool antigen among study participants was 36.4% (95%CI: 31.0-39.9). Older age (AOR(adjusted odds ratio) (95%CI): 4.9(1.35,7.88), rural residence (AOR (95%CI): 2.7(1.49,4.9), larger family size (AOR(95%CI): 2.17(1.22,3.85), alcohol consumption (AOR(95%CI): 2.72(1.58,4.69), smoking cigarette (AOR(95%CI):2.29(1.22,4.3), and absence of washing hand after toilet (AOR(95%CI):3.46(1.86,6.44) were independent predictors of *H. pylori* infection among study participants.

Conclusion: In the current study area, high (36.4%) prevalence of *H. pylori* infection was observed among dyspeptic patients. Rural residence, older age, larger family size, absence of hand washing after toilet, the habit of alcohol consumption, and smoking cigarettes were significantly identified predictors of *H. pylori* infection. The finding of this study could be considered to design and implement intervention measures on identified predictors of the *H. pylori* infection among study participants. Moreover, provision of health educations on hygienic practices and behavioural factors of the study participants could aid to reduce the *H. pylori* infection rate.

Keywords: Helicobacter pylori; predictors; Wolkite; Southern Ethiopia

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Introduction

Helicobacter pylorus (*H. pylori*) is one of the global public health important bacteria that affected more than half of the world's population [1]. The overall burden of the infection is high geographic variability within and between countries, with a higher burden mainly reported from developing countries; a study reported 50.8% in developing and 34.7% in developed countries [2]. The burden of H. pylori infections remain high in African countries, a study indicated 81.7%, 73.2%, 66.1%, and 27.3% in Nigeria [3], Cameroon [4], Eastern Cape Province [5], and Eastern Uganda [6], respectively. The previous studies conducted in Ethiopia reported; 30.3%, 36.8%, 42.8%, 71.1%, 51.4%, and 83.3% of prevalence in Shashemene [7], Addis Ababa[8], Mizan Aman

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[9], Gondar [10], Hossana [11], and Hawassa [12], respectively.

H. pylorus is a gram-negative micro-aerophilic bacterium that infects the epithelial lining of the stomach and it is a principal cause of chronic gastritis, peptic ulcer disease, and a major contributor to gastric carcinoma and mucosa-associated lymphoid tissue (MALT) lymphoma [13,14]. Moreover, it was classified as a class one carcinogen because of its causal relationship to gastric adenocarcinoma, one of the world's dead least cancers [15, 16]. Although the exact route of transmission is uncertain, whereas the most likely transmission routes from person to person were either oral to oral or fecal-oral [17]. It possesses different mechanisms to colonize the host: surviving in an acidic stomach environment, flagella-mediated motility, attaching to host receptors by adhesions, and causing tissue damage by releasing toxin [13, 18, and 19] and finally it resulted in several gastrointestinal diseases including gastritis, peptic ulcer, duodenal ulcer, and gastric cancer [14].

H. pylori infection is associated with multiple factors, including socio-demographic factors, low socioeconomic status, hygiene practice, and lifestyle of the population [8–10, 20]. *H. pylori* can be diagnosed by using serological test, urea breath test (UBT), culture, polymerase chain reaction (PCR) and endoscopy; however, the choice of diagnostic method mainly depends on availability, cost, clinical situation, the burden of infection on a community, differences in performance of the test, and use of ant secretory treatment or antibiotics [19,21-23].

In Ethiopia, several epidemiological studies reported varying burden of *H. pylori* infection among adults in different areas [12, 20, 24, 25], and the majority of studies were done by using IgG and/or IgM antibody rapid tests which have questionable performance in detecting acute infection and distinguishing current infection from previous exposure, which might probable affects exact burdens of infection in the area and community at all. Furthermore, the majority of the previous study conducted in Ethiopia mainly on adults not included the age under 18 years. Updated information on the burden of the infection and its independent predictors were important to plan and design effective intervention measures to reduce the public health impact of *H. pylori* infection in the study area and beyond. However, there is limited data on the prevalence of *H. pylori* infection and its predictors in Ethiopia particularly in the Gurage zone (study area). Therefore, this study aimed at determining the prevalence and its predictors of *H. pylori* infection among dyspeptic patients in Wolkite University specialized hospital at Gurage zone by using the stool antigen test method.

Materials and methods

Study design, period, and area

A facility-based cross-sectional study was employed from September to December, 2020 at Wolkite University specialized hospital in the Gurage zone, South Nation Nationality and Peoples Regional State (SNNPR), Ethiopia. The hospital is situated at Gubriye sub-city, 13km far away from the zonal town, Wolkite which is located 158km from the capital city of Ethiopia, Addis Ababa. The hospital provides services for more than 1.2 million people living in the Gurage zone and the adjoining zonal people.

Sample size determination and sampling technique

The sample size for the study was determined by using a single population proportion formula by assuming: 71.1% prevalence of H. pylori infection from the previous study conducted in Gondar, Ethiopia [10], 95% level of confidence, and 0.05 margin of error. Finally, we got sample sizes of 316. Accordingly, all consecutively identified dyspeptic patients who have dyspeptic complaints were included in the study until attaining sample size.

Eligibility criteria

Inclusion Criteria

All study participants who have dyspeptic complaints and voluntary to participate were included in the study.

Exclusion Criteria

Study participants who took treatment for *H. pylori* infection within the last three months [23], severely ill patients who were unable to give information and pregnant women were excluded from the study.

Study variables

Prevalence of H. pylori infection was a dependent variable, and socio-demographic variables (age, gender, residence, family size per household, martial and educational status), behavioural variables (habit of alcohol consumption, smoking cigarette, hand washing after toilet, chewing chat, coffee, and tea consumption), latrine type and source of dirking water were independent variables of the study.

Data collection and laboratory methods

Data regarding socio-demographic characteristics, behavioral, and other related factors of study participants was collected through face-to-face interviews using structured questionnaire at outpatient and inpatient department of the hospital by trained nurses. Approximately 3 grams of stool specimen was collected in clean wide mouth and screw-capped containers from each study participant at the central laboratory of the hospital. *H. pylori* stool antigen was determined by Wondfo Helicobacter pylori feces test kit (Guangzhou Wondfo Biotech, China) which detect antigen through qualitative immune chromatography assay principles with a sensitivity of 99.1% and specificity of 99.2% as compared to ELISA. After stool specimen was collected and checked for appropriateness a small portion of stool specimen was taken by applicator stick and mixed with buffers solution and left to settle up to 1 minute. Then three drops of the mixed solutions were added to the test cassette and the test result was interpreted after 10 minutes. If there is a line taking part at the sections marked with 'C' in the result display conforms to the negative result whereas two indication lines taking parts at the sections both marked with 'C' and 'T' conforms to the positive result.

To ensure the reliability and quality of the data, the questioner was pretested and its completeness was checked regularly and

also all the laboratory procedures were performed by following standard operational procedures (SOP) of the hospital and manufacturer instructions.

Data processing and analysis

The data was entered and analyzed by using SPSS version 22 software. Frequency tables, percentages, and descriptive summaries were used to present data. Binary logistic regression analysis was performed to determine the presence and strength of an association between the prevalence of *H. pylori* infection and independent variables. Bivariate analysis was performed for each independent predictors to select predictors candidate for multivariate analysis. Predictors in bivariate analysis with a p-value <0.25 were taken as candidates for multivariate analysis. Multivariate analysis was used to control the effect of confounding variables and to identify independent predictors for the prevalence of H. pylori infection. The 95%CI, crude odds ratio (COR), and adjusted odds ratio (AOR) was used to see the strength and directions of associations. The p-value <0.05 was considered statistically significant.

Ethical considerations

Ethical clearance was obtained from Wolkite University ethical review board. Written informed consent was obtained from the study participant whose age greeter than 18 years, and informed consent for participation of minors under the age of 18 years was obtained from parents/guardians. Every response of the patients was kept confidential and their result was also communicated with their respective physician for proper management. The study was carried out in accordance with the Declaration of Helsinki.

Results

Socio-demographic, behavioral, and related characteristics of study participants

A total of 316 individuals were participated in the study with a response rate of 100%, of which 40.8% and 59.2% were males and females, respectively. The mean (±SD) age of participants was 35.1 ± 12.2 years, which ranged between 12-73 years. The majority of the study participants were rural area residents (60.4%). About 49.7%, 28.8%, and 61.7% of the study participants were married, attained higher education, and had larger family sizes (≥ 3), respectively. During the time of the data collection, 41.5%, 28.8%, 38%, 72.8 73.4%, and 71.2%, of the study participants had a habit of alcohol consumption, smoking cigarette, chewing chat, washing hand after toilet use, consumptions of coffee and tea, respectively **(Table 1).**

Table 1. Socio-demographic and other related characteristics of the study participants at Wolkite University specialized hospital, September to December 2020 (n=316).

Variables	Categories	Frequency (%)
Age in years	<20	21(6.6%)
	20-29	106(33.5)
	30-39	86(27.2)
	40-49	55(17.4)
	≥50	48(15.2)
Gender	Male	129(40.8)
	Female	187(59.2)
Residence	Urban	125(39.6)
	Rural	191(60.4)
Marital status	Single	120(38)
	Widowed	17(5.3)
	Divorced	22(7)
	Married	157(49.7)
Educational status	Illiterate	83(26.3)
	Primary	67(21.2)
	Secondary	75(23.7)
	University/college	91(28.8)
Family size per household	<3 peoples	121(38.3)
	≥3 peoples	195(61.7)
Alcohol consumption	Yes	131(41.5)
	No	185(58.5)
Cigarette smoking	Yes	72(22.8)
	No	244(77.2)
Chewing chat	Yes	120(38)
	No	196(62)
Coffee consumption	Yes	232(73.4)
	No	84(26.6)
Tea consumption	Yes	225(71.2)
	No	91(28.8)
Washing hand after toilet	Yes	230(72.8)
	No	86(27.2)
Washing hand before meal	Yes	183(57.9)
	No	133(42.1)
Water source	Tanker	63(19.9)
	Well	71(22.5)
	Pipe	182(57.6)
Latrine type	Private	185(58.5)
	Public	88(27.8)
	Field	43(13.6)

Prevalence of *H. pylori* infection among study participants

The overall prevalence of *H. pylori* infection detected by feacal stool antigen among study participants was 36.4% (95%CI: 31.0-39.9). The prevalence of *H. pylori* infection was 41.1% in males and 33.2% in females respectively, their difference was not significant (p>0.05). The proportion of *H. pylori* infection was 54.2%, 51.1%, and 52.8% among the study participants who had grouped in ≥50 age categories, the habit of alcohol consumption at least once a week, and cigarette smoking at least once a week, respectively. Among study participants who had never washed their hands after the toilet, 52.3% of them were positive for *H. pylori* stool antigen **(Table 2)**.

Independent predictors of *H. pylori* infection among study participants

In bivariate analysis model by considering p-vale<0.25; increasing age, gender, residence, educational status, family size, a habit of alcohol consumption, a habit of smoking cigarette and washing

Table 2. Bearable analysis of predictors of *H. pylori* infections among study participants at Wolkite University specialized hospital, September to December 2020.

Predictors	Categories	*H. pylori* status		COR(95%CI)	p-value
		Negative	Positive		
Age in years	<20	16(76.2)	5(23.8)	1	
	20-29	74(69.8)	32(30.2)	1.38(0.46,4.1)	0.55
	30-39	63(73.3)	23(26.7)	1.16(0.38,3.55)	0.78
	40-49	26(47.3)	29(52.7)	3.56(1.14,6.1)	0.028
	≥50	22(45.8)	26(54.2)	3.78(1.19,6.9)	0.024
Gender	Male	76(58.9)	53(41.1)	1.4(0.8,2.2)	0.15
	Female	125(66.8)	62(33.2)	1	
Residence	Urban	94(75.2)	31(24.8)	1	
	Rural	107(56)	84(44)	2.38(1.44,3.9)	0.001
Marital status	Single	79(65.8)	41(34.2)	1	
	Widowed	9(52.9)	8(47.1)	1.7(0.6,4.7)	0.3
	Divorced	12(54.5)	10(45.5)	1.6(0.6,4.03)	0.31
	Married	101(64.3)	56(35.7)	1.06(0.64,1.7)	0.79
Educational status	Illiterate	46(55.4)	37(44.6)	1.9(1.02,3.55)	0.04
	Primary	44(65.7)	23(34.3)	1.2(0.6,2.4)	0.5
	Secondary	47(62.7)	28(37.3)	1.4(0.7,2.7)	0.29
	University/college	64(70.3)	27(29.7)	1	
Family size	<3	87(71.9)	34(28.1)	1	
	≥3	114(58.5)	81(41.5)	1.8(1.1,2.9)	0.016
Alcohol consumption	Yes	64(48.9)	67(51.1)	2.98(1.8,4.8)	<0.001
	No	137(74.1)	48(25.9)	1	
Cigarette smoking	Yes	34(47.2)	38(52.8)	2.4(1.4,4.1)	0.001
	No	167(68.4)	77(31.6)	1	
Chewing chat	Yes	78(65)	42(35)	0.9(0.56,1.4)	0.68
	No	123(62.8)	73(37.2)	1	
Coffee consumption	Yes	151(65.1)	81(34.9)	0.7(0.4,1.3)	0.36
	No	50(59.5)	34(40.5)	1	
Tea consumption	Yes	145(64.4)	80(35.6)	0.8(0.53,1.4)	0.6
	No	56(61.5)	35(38.5)	1	
Washing hand after toilet	Yes	160(69.6)	70(30.4)	1	
	No	41(47.7)	45(52.3)	2.5(1.5,4.1)	<0.001
Washing hand before meal	Yes	121(66.1)	62(33.9)	1	
	No	80(60.2)	53(39.8)	1.29(0.8,2.05)	0.277
Water source	Tanker	38(60.3)	25(39.7)	1.27(0.7,2.2)	0.42
	Well	43(60.6)	28(39.4)	1.26(0.71,2.22)	0.42
	Pipe	120(65.9)	62(34.1)	1	
Latrine type	Private	120(64.9)	65(35.1)	1	
	Public	54(61.4)	34(38.6)	1.16(0.68,1.96)	0.57
	Field	27(62.8)	16(37.2)	1.09(0.55,2.1)	0.79

hand after toilet were identified candidate variables to be tested for association with prevalence of *H. pylori* infection in multivariate analysis.

Multivariate analysis of predictors associated with *H. pylori* infection

Multivariate binary logistic regression models were used to control confounding variables and identify the independent predictors of *H. pylori* infection. After adjusting for confounding variables: being in a 40-49 age groups (AOR (95%CI): 4.9(1.35, 7.88), rural residence (AOR (95%CI): 2.7(1.49, 4.9), larger family size (AOR(95%CI): 2.17(1.22,3.85), alcohol consumption (AOR(95%CI): 2.72(1.58,4.69), smoking cigarette (AOR(95%CI):2.29(1.22,4.3), and absence of washing hand after toilet use (AOR(95%CI):3.46(1.86,6.44) were significantly identified independent predictors of H. pylori infection among study participants.

Study participants who had in a 40-49 age group were nearly 5 times more likely to develop *H. pylori* infection (AOR (95%CI): 4.9(1.35, 7.88) than lower age groups. Study participants who had rural area residents were 3 times higher odds of H. pylori infection compared to urban counterparts. A significantly high infection rate was also observed in study participants with larger

family size as compared with lower one (AOR (95%CI): 2.17(1.22, 3.85).

Alcohol consumption showed a significant association with *H. pylori* infection, study participants who had a habit of alcohol consumptions at least once a week were 2.72 times more likely infected with *H. pylori* than those who had never consumed alcohol. A high burden of *H. pylori* infection was observed among study participants who had a habit of smoking cigarettes at least once a week as compared with non-smokers, which was significant (P=0.001). The odds of being infected by *H. pylori* bacteria among individuals who never wash their hands after the toilet is 3.46 times higher than those who wash their hands always after toilet use **(Table 3)**.

Discussion

The current study attempted to determine the prevalence and its predictors of *H. pylori* infection among dyspeptic patients attending at Wolkite University specialized hospital in Gurage zone, Southern Ethiopia by using the stool antigen test method. The overall prevalence of *H. pylori* infection among dyspeptic patients attending Wolkite University specialized hospital was 36.4% (95%CI: 31.0-39.9).

The overall prevalence of *H. pylori* infection among study participants obtained in this study was comparable with findings reported from United Arab Emirates (41%) [26], and different part of Ethiopia; Addis Ababa (36.8%) [8], Gondar (37.3%) [10], Mizan Aman Town (42.08) [9], Bahir Dar (41.6%) and Shashemene (30.3%) [7]. Whereas our finding was higher than studies reported from Dessie, Ethiopia (30.4%)[25], Habana, Cuba (5%) Mbarara, Uganda (24.3%) Eastern Uganda (27.3%) [6], Indonesia (22.1%) and Nigeria (23.5%) However, the finding of this study was lower than reports from India (85%) Kano, Nigeria (81.7%) Cameroon (73.2%) [4], Abuja, Nigeria (58.8%) Cameroon (64.39%) Eastern Cape Province (66.1%) [5], and from several studies reported from different part of Ethiopia such as; Hawassa (83.3%) Debretabore (72.2%) Jigjiga (71%) [24], Butajira (52.4%) and Gondar (65.7%) The observed variations in the burdens of the infection might be due to the difference in the socioeconomic factors, study setting, study periods, sample size, personal hygienic condition at individual and community level as well as the lifestyle of the population contributing to the risk of infection. Another reason could be the difference in laboratory detection methods of *H. pylori* in each study. The difference in the sensitivity and specificity of each *H. pylori* detection method may also affect the detection rate of infection and consequently its prevalence. Moreover, the majority of the previous studies were used antibody tests which may lead to overestimation of the burden of the infections.

The results of the current study showed a statistically significant association between age and prevalence of *H. pylori* infection. The prevalence of *H. pylori* infection was higher in older age groups. This finding was contrary to previous studies done in Ethiopia; Addis Ababa [8], Hawassa and Dessie [25]. However, our finding was in agreement with studies reported from Brazil Indonesia United Arab Emirates [26], Cameroon [4], Butajira Gondar and Debretabore, Ethiopia Increased prevalence of infection with age might be due to *H. pylori* can be acquired in early childhood and persist throughout the lifetime of the patient and may cause infection at an older age.

Socio-demographic factors can play a great role in determining *H.*

Table 3. Multivariate analysis of predictors associated with *H. pylori* infection among study participants at Wolkite University specialized hospital, September to December 2020.

Predictors	Categories	*H. pylori* status		COR(95%CI)	p-value	AOR(95%CI)	P-value
		Negative	Positive				
Age in years	<20	16(76.2)	5(23.8)	1		1	-
	20-29	74(69.8)	32(30.2)	1.38(0.46,4.1)	0.55	2.03(0.5,6.9)	0.26
	30-39	63(73.3)	23(26.7)	1.16(0.38,3.55)	0.78	1.27(0.37,4.4)	0.68
	40-49	26(47.3)	29(52.7)	3.56(1.14,6.1)	0.028	4.9(1.35,7.88)	0.015
	≥50	22(45.8)	26(54.2)	3.78(1.19,6.9)	0.024	3.55(0.96,7.09)	0.057
Gender	Male	76(58.9)	53(41.1)	1.4(0.8,2.2)	0.15	0.96(0.55,1.6)	0.89
	Female	125(66.8)	62(33.2)	1	-	1	-
Residence	Urban	94(75.2)	31(24.8)	1	-	1	-
	Rural	107(56)	84(44)	2.38(1.44,3.9)	0.001	2.7(1.49,4.9)	0.001
Educational status	Illiterate	46(55.4)	37(44.6)	1.9(1.02,3.55)	0.04	1.36(0.65,2.84)	0.41
	Primary	44(65.7)	23(34.3)	1.2(0.6,2.4)	0.5	1.47(0.66,3.25)	0.33
	Secondary	47(62.7)	28(37.3)	1.4(0.7,2.7)	0.29	1.9(0.9,4.07)	0.09
	University/College	64(70.3)	27(29.7)	1	-	1	-
Family size	<3	87(71.9)	34(28.1)	1	-	1	-
	≥3	114(58.5)	81(41.5)	1.8(1.1,2.9)	0.016	2.17(1.22, 3.85)	0.008
Alcohol consumption	Yes	64(48.9)	67(51.1)	2.98(1.8,4.8)	<0.001	2.72(1.58, 4.69)	<0.001
	No	137(74.1)	48(25.9)	1	-	1	-
Cigarette smoking	Yes	34(47.2)	38(52.8)	2.4(1.4,4.1)	0.001	2.29(1.22, 4.3)	0.01
	No	167(68.4)	77(31.6)	1	-	1	-
Washing hand after toilet	Yes	160(69.6)	70(30.4)	1	-	1	-
	No	41(47.7)	45(52.3)	2.5(1.5,4.1)	<0.001	3.46(1.86, 6.44)	<0.001

pylori infection. Rural area residence was significantly associated with *H. pylori* infection. Study participants who had rural area residents were 3 times higher odds of *H. pylori* infection compared to urban counterparts. This result was similar to finding reported from Turkey [8] and Hawwassa, Ethiopia [12]. This might be likely related to a lack of information on possible prevention strategies to risk factors of *H. pylori* infection and safe hygiene practices among rural area residents.

Several studies indicated that crowded living conditions were associated with increased risk of *H. pylori* infection and favor the transmission of infection between individuals. In the current study significantly high infection rate was observed in study participants with larger family sizes as compared with smaller counterparts. A similar observation was reported from studies done in Brazil Shashemene Dessie [25], and Mizan Aman, Ethiopia [9]. This might be likely due that high family members per household would play a significant role in the interfamilial transmission of the *H. pylori* infection between individuals, which may result in a high prevalence of *H. pylori* infection.

Alcohol consumption in the current study showed a statistically significant positive association with *H. pylori* infection. This result contradicts the finding reported by Kibru et al who reported a significant negative association between alcohol consumption and *H. pylori* infection. However, our finding was in agreement with studies reported from Turkey Eastern Cape Province [5], Ethiopia [11,20,24] which reported a significant positive association between alcohol consumption and *H. pylori* infection. The probable reason for a significant association in our study might be explained due to the hypothesis that heavy alcohol consumption favors *H. pylori* infection by damaging the gastric mucosa. In addition to damaged gastric mucosa, bacterial adherence and host factors may also be involved in the synergistic effect for infection in an alcohol consumer.

In this study, *H. pylori* stool antigen positivity was statistically associated with the habit of smoking cigarette which was similar to previous reports from Turkey [8], Kano, Nigeria [3], Butajira and Jigjiga, Ethiopia [24], they reported cigarette smoking showed significant associated with *H. pylori* infection. This might be probably due to smoking cigarettes may result in a peptic ulcer disease and dyspeptic symptoms by impairing the immune system, which facilitates the adherence of *H. pylori* to the gastric mucosa.

Different studies reported socioeconomic factors, hygienic practice at individual and community level as well as the lifestyle of the populations were predisposing factors for *H. pylori* infection [9]. In the current study absence of washing hands after the toilet was statistically associated with a higher rate of *H. pylori* infection. The odds of being infected by *H. pylori* bacteria among individuals who never wash their hands after the toilet is 3.46 times higher than those who wash their hands always after toilet use. This is finding is in agreement with studies conducted elsewhere [20,27]. Our study finding was interpreted by considering the following limitations. The cross-sectional nature of the study design prohibited to establish causal links between H. pylori infection and identified predictors. The study population was only symptomatic patients presented to the hospital, which cannot be generalized for the asymptomatic patients. Alcohol consumption and cigarette smoking data about amount, type, and duration were not collected. However, the information reported would be a significant contribution to the existing knowledge on the burden and predictors of *H. pylori* infection among all aged populations.

Conclusion

In the current study area, high (36.4%) prevalence of *H. pylori* infection was observed among dyspeptic patients. Rural residence, older age, larger family size, absence of hand washing after toilet, a habit of alcohol consumption, and smoking cigarettes were independent predictors of *H. pylori* infection. The finding of this study could be considered to design and implement intervention measures on identified predictors of *H. pylori* infection. Moreover, provision of health educations on hygienic practices and risk behaviours of the study participants like smoking cigarettes and alcohol consumption could aid to reduce the *H. pylori* infection rate in the study area. Further large-scale community-based studies are needed to better characterize the role of these potential sources of the associated factors of *H. pylori* infection.

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