PREVALENCE OF HELICOBACTER PYLORI IN ADMITTED PATIENT AT TERTIARY CARE HOSPITAL SWAT

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ABSTRACT

Background: Infection caused by the bacterium Helicobacter pylori, or H. pylori, is a well-known causative agent of diseases of the gastrointestinal tract. Gastritis, gastric ulcers, and gastric cancer are just a few of the numerous diseases caused by the H. pylori bacterium. The study was intended to identify the prevalence of H. pylori infection among patients admitted to hospitals, identify the demographics and clinical features of the patients, and establish correlations among the factors of lifestyle and hygiene practices.

Methods: A cross-sectional study was carried out on a tertiary care center in Swat. A total of 200 admitted patients were randomly selected from Gastroenterology, Medical, and Surgical wards. The study was done using interviews, questionnaires, medical record analysis, and lab results. Descriptive statistical methods were employed to analyze demographic information, clinical histories, and symptoms of patients. The Chi-Squared Test was used to identify any association between H. pylori infection and age, gender, intake of caffeine, hand-washing habit, and eating fast foods.

Results: The prevalence of H. pylori infection was found to be 77%. Infection was more common in women (71.2%) than men (29%), with a high prevalence found among individuals aged 21-30 years (34.5%). Most patients (77%) had received previous treatment for their gastrointestinal complaints. The main complaints were loss of appetite (60%), vomiting (56%), and epigastric abdominal or burning pain (52%). There were significant correlations of H. pylori infection with age, caffeine ingestion, as well as hand-washing habits ($p < 0.05$), but not with fast food ingestion.

Conclusion: Infection with H. pylori is found to be highly prevalent among admitted patients, and the rate is higher among young adults and women. Lack of personal hygiene and certain lifestyle habits play an important part in the transmission and development of H. pylori infection among the patients.

INTRODUCTION

Helicobacter pylori (H. pylori) is a Gram-negative bacterium linked to gastritis, peptic ulcer disease, and gastric cancer, classified as a Class I carcinogen by WHO. Infections affect up to 50% of the global population, with higher rates in low-income regions due to factors like poor sanitation and overcrowding. In Pakistan, particularly in under-resourced areas, infection rates exceed 50-60% in the general population (Ullah & Ijaz., 2025). H. pylori are significant bacterial pathogen that was discovered in the early 1980s by an Australian scientist Barry Marshall and Warren. (FitzGerald, R., & Smith, S.M, 2021). It infects nearly 4.4 billion persons worldwide. It has distinctive properties to survive in a harsh acidic environment of gastric epithelium. (Crowe S.E, 2019). This bacterium can be passed basically by contaminated food, water saliva, vomiting, and fecal material. Its primary mode of transmission is fecal-oral or oral-oral routes (Hassan M.N et al., 2020). The person with this infection experience acute symptoms like, nausea, vomiting, abdominal pain, bloating, burning, and loss of appetite. If the bacteria get ahead to survive these symptoms become chronic infection. When the person contact with bacteria they get infected H.pylori infection can be diagnosed invasive and non-invasive, through Stool culture, Breath test and by upper endoscopy. (Hassan M.N et al., 2020).

To treat H.Pylori different anti-secretory agents and antibiotics are used for its treatment. A triple therapy consisting a proton-pump inhibitor (PPIs) and antibiotics suggested as the first-line treatment. H. pylori treatment require of a strong acid suppressant in combinations with antibiotics and/or bismuth. The first line regimen for the eradication of h pylori infection is PPI and antibiotic clarithromycin, amoxicillin and metronidazole. (Malfertheiner p et al, 2023).

Understanding the pathology, epidemiology and treatments options for h.pylori infection are essential for developing public health interventions, and patient management strategies. Hospital-based studies in Khyber Pakhtunkhwa (KPK) reveal a concerning prevalence of H. pylori infections. A study at General Hospital Peshawar found an 86% positivity rate among patients with gastrointestinal symptoms (HABIB et al., 2024). Another study from Rehman Medical Institute reported a 29.3% infection rate, more common in males. Further investigations from Karachi indicated a 64.8% prevalence among dyspeptic patients, linked to male gender, low socioeconomic status, and dietary habits (anwar et al., 2023). Additionally, research in nearby Haripur showed a 56.6% positive rate, highlighting a significant reservoir of infection in the region (Akhter et al., 2022). Research indicates a high prevalence of H. pylori infection among symptomatic patients in Pakistan, with a study in Karachi reporting 64.8% prevalence among dyspeptic individuals. Factors such as male gender, low socioeconomic status, and consumption of outside foods were significantly associated with infection (shahzad et al., 2025). Hospitalized patients with chronic gastrointestinal issues exemplify a key group for epidemiological studies, as H. pylori is crucial in conditions like dyspepsia and peptic ulcer disease. Understanding its prevalence in this demographic can enhance diagnostic and treatment strategies in resource-limited healthcare settings (alam et al., 2023).

Specific data on inpatients in Khyber Pukhtankhwa tertiary hospitals is limited and varied, particularly concerning diagnostic methods and risk factors. This highlights the necessity for well-structured prevalence studies to assess the infection burden among admitted patients and explore demographic and clinical predictors, which are vital for effective healthcare planning and intervention. This study aims to contribute to this knowledge by examining the prevalence and associated factors of H. pylori infection in admitted patients at a tertiary care hospital in Swat, Pakistan.

METHODOLOGY:

This chapter highlights the approach and methods used in meeting the goals of the study. The study design and setting, sample, and procedure of collecting the information will be discussed. In this section, aspects concerning the morality of the study will also be highlighted.

Study Design

The study used cross-sectional study design. This study design was permit the data to be collected from the respondents at one single moment. This was an efficient study for determining the prevalence and related factors for H. pylori infection within a short period.

The research was conducted at a tertiary care hospital in the Swat region. The purposive selected hospital was found to have desirable attributes like a larger inpatient bed strength with Gastroenterology, Medical, and Surgical wards, which meet the criteria for the study objectives.

Random sampling was employed to choose admitted patients to be involved in the study. For this study, a total of 200 patients will be selected. The sample was calculated using the Raosoft sample size through 95% confidence level, 5% margin of error and 50% prevalence.

The inclusion criteria for the study was admitted patients in the Gastroenterology, Medical, and Surgical wards, and Patients who give informed consent to be part of the study. Patients who are considered outpatients, and not ready for voluntary participation was excluded from the study.

3.8 Data Collection

Data collection will involve a variety of sources:

Patient Interviews:
Structured interviews was conducted to collect data regarding the demographic details, health history, and symptoms of the patients.

Medical Record Review: Relevant medical records was accessed for review for obtaining medical information.

Laboratory Tests: Laboratory test results pertinent to H. pylori infection was collected to determine the diagnosis.

The structured questionnaire is helpful in collecting data in an organized manner, and it ensures that there is similarity among all respondents.

Data Analysis

Descriptive Statistics: These would be utilized for the purpose of determining the rate of occurrence of H. pylori infection and describing the demographics of the population.

Inferential Statistics: The Chi-square test was used to test whether there exists any relationship between H. pylori infection and categorical data such as age, gender, and other symptoms.

RESULTS

Among the 200 participants, *H. pylori* infection was more common in females (71.2%) than males (29%). The largest proportion of patients belonged to the 21–30 years age group (34.5%), followed by those aged 51 years and above (23.5%). Most participants (77%) reported having received prior treatment, while 16.5% had not received any treatment and 6.5% were unsure. Overall, the findings show that *H. pylori* infection predominantly affected young adults and females, with a high proportion of patients having a history of treatment (see table 1).

Table 1: demographic data of the participants		
Category	**Frequency (n-200)**	**Percentage (%)**
Prevalence of H.Pylori		
Male	58	29%
Female	142	71.2%
Age group		

10-20 years	18	9%
21 – 30 years	69	34.5%
31 – 40 years	38	19%
41 – 50 years	28	14%
51 and above	47	23.5%
Received any treatment		
Yes	154	77%
No	33	16.5%
Not Sure	13	6.5%

History of patient and associated symptoms

Table 2 shows that most participants had significant NSAID exposure (88%) and a high burden of upper gastrointestinal disorders, particularly GERD (57.5%) and gastritis (51.5%), while peptic ulcer disease (18%) and gastric carcinoma (1.5%) were less common. Common comorbidities included hypertension (15%) and diabetes (7.5%). The most frequently reported symptoms were loss of appetite (60%), nausea (56%), abdominal pain/burning (52%), and vomiting (52%), with bloating (22.5%) being least common. Overall, the population was characterized by extensive NSAID use, prevalent gastrointestinal conditions, and typical dyspeptic symptoms consistent with *H. pylori*–related and acid-related disorders.

Table 2: History of patient and associated symptoms		
Characteristics	**Frequency**	**Percentage**
History of any Ansaid use		
Yes	176	88%
No	24	12%
History of patient		
Gastritis	103	51.5%
Peptic Ulcer	36	18%
GERD	115	57.5%
Gastric Carcinoma	3	1.5%
Hypertension	30	15%
Diabetes	15	7.5%
Heart disease	8	4%
cholelithiasis	8	4%
Iron Deficiency/Iron Deficiency Anemia	10	5%
Other	37	18.5%
Sign and symptoms		
Aching/burning in abdomen	105	52%
Nausea	112	56%
vomiting	104	52%
bloating	45	22.5%
indigestion	70	35%
Loss of Appetite	121	60%

Prevalence on basis of age.

The study demonstrates a high overall prevalence of *Helicobacter pylori* infection (77%) and a statistically significant association between age and infection status ($\chi^2 = 18.61$, df = 4, $p < 0.05$). The lowest contribution to positivity was observed in the 10–20 years age group, while the 21–30 years group showed the highest prevalence. Infection rates remained moderate in the 31–40 years group and increased further in individuals aged 41–50 years and ≥51 years, indicating a rising trend with advancing age. These findings suggest that *H. pylori* infection is more common in adults and older individuals, likely due to cumulative exposure and chronic persistence of the infection over time (see table 3).

Table 3: Prevalence on basis of age.							
Age Groups	**No. of samples**	**Positive**		**Negative**		**Chi-Square**	**df**
		No.	**%**	**No.**	**%**		
10-20 years	18	9	5%	9	4.5%	**X²(Cal) 18.61 X²(tab) 9.48**	**4**
21 – 30 years	69	59	30%	10	5%		
31 – 40 years	38	24	11%	14	7%		
41 – 50 years	28	26	13%	2	1.5%		
51 and above	47	37	18%	10	5.5%		
Overall	200	155	77%	45	23%		

Relation of Caffeine Consumption with H.pylori.

The relationship between caffeine consumption and *Helicobacter pylori* infection was analyzed using the Chi-square test and demonstrated a statistically significant association between the number of caffeinated drinks consumed per day and *H. pylori* infection status (see table 4).

Table 4: Relationship of Caffeine and *H. pylori* infection		Chi-square					
		Caffeinated drinks consumed per day.				Total	
		0	1 to 2	2 to 3	3 or more		**x² (Cal) 28.8**
H. pylori infection present	Yes	21	22	41	51	135	**x² (tab) 7.82**

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	No	32	12	10	11	65	**df**	
Total		53	34	51	62	200	**3**	

Relation between *H. pylori* and Hand-washing Before eating

The association between *Helicobacter pylori* infection and hand-washing before eating was assessed using the Chi-square test and revealed a statistically significant relationship between hand-washing practices and infection status (see table 5).

Table 5: Relation between *H. pylori* and Hand-washing Before eating					Chi-square (x^2)
		Do you always wash your hands before eating?			X^2(Cal) 23.2
					X^2(tab) 3.81
		no, not always	yes, always	Total	
	Positive	100	30	130	df
H.Pylori	Negative	30	40	70	1
Total		130	70	200	

Relation between *H. pylori* infection and fast food consumption.

The association between *Helicobacter pylori* infection and regular consumption of spicy and fast food was evaluated using the Chi-square test and showed no statistically significant relationship between the two variables.

Table 6: Relation between *H. pylori* infection and fast food consumption.					Chi-square X^2
		Do you consume spicy and fast food regularly			x^2 (Cal) 0.192
					X^2 (tab) 3.84
		no, not always	yes, always	Total	
	positive	56	96	152	df
H.pylori	Negative	16	32	48	1
	Total	72	128	200	

DISCUSSION

The data from patient history and symptoms provide a comprehensive overview of the health conditions observed in the admitted patients.GERD and Gastritis were prevalent conditions, affecting 57.5% and 51.5% of patients, respectively Gastro esophageal Reflux Disease (GERD), heart disease. Daibetes, and hypertension were also noteworthy. Symptoms such as abdominal pain, nausea vomiting, bloating, indigestion, loss of appetite were prevalent among the majority of patients. These findings align with the well-established association between h. pylori and gastrointestinal disorders, including gastritis GERD and peptic ulcers. The presence of heart disease, Diabetes and other conditions further emphasizes the need for holistic patient care. The result of the present study indicates a potential association between caffeine consumption and h.pylori infection, patient consuming 5 or more caffeinated drinks per day demonstrated a higher prevalence of h.pylori compare to those consuming no caffeinated drinks. This observation aligns with existing literature suggesting a potential link between caffeine consumption and increase risk of h.pylori infection. Further exploration of this relationship could contribute valuable insights into preventive strategies. The result of the study also underscore the importance of hand washing before eating as a potential factor influencing h.pylori prevalence, those who did not wash their hands regularly before eating exhibited a higher likelihood of h.pylori infection. The findings reinforce the significance of a basic hygiene practices in preventing the transmission of h.pylori supporting public health initiatives to promote hand hygiene. The outcomes of the study strongly suggest a potential correlation between fast food consumption and h.pylori infection, individuals who consumes fast food demonstrated high risk of h.pylori infection. This association may be linked to the quality and safety of fast food, emphasizing the importance of dietary habits and h.pylori prevention.

The gender wise difference in h.pylori prevalence with female exhibiting higher prevalence 142(71%) compare to male 58(29%). This gender disparity warrens further investigation to understand the underlining factors contributing to the observed difference, Hormonal influences, dietary habits, or other gender specific factors may play a role in the varying prevalence rates. The age wise distribution of h.pylori prevalence as depicted indicates varying rates across different age groups. The highest prevalence was observed in the age group 21-30 years (35.5%) followed by the age group 51 years and above (23.5%). Understanding age specific trends are crucial for targeted interventions and emphasizes the need for age appropriate screening and preventive measures.

The study's limitations include its conduct in a single tertiary care hospital, limiting generalizability; a cross-sectional design that hinders causal relationship determination; reliance on self-reported data which may be biased; inadequate assessment of several risk factors, and lack of multiple diagnostic methods for confirming H. pylori infection. Additionally, the exclusion of outpatients restricts the applicability of the findings to the broader population.

CONCLUSION

The study found a high prevalence of *H. pylori* infection among admitted patients, with females and young adults being most affected. Most participants had a history of treatment and common symptoms included loss of appetite, nausea, and abdominal pain. Infection was significantly associated with age, caffeine consumption, and poor hand-washing practices, while fast food consumption showed no significant link. Overall, *H. pylori* infection is common in this population, with hygiene and lifestyle factors playing an important role in its transmission.

Recommendations

1. *Launch public health campaigns* to promote hygiene, particularly hand washing, as a preventive measure against H. pylori transmission.

2. *Offer dietary counseling* for individuals with high caffeine consumption and frequent fast food intake, addressing potential risks for H. pylori infections.

3. *Implement targeted screening programs* based on age and gender variations in H. pylori prevalence for early detection among high-risk groups.

4. *Conduct further research* to explore the link between caffeine, fast food, and H. pylori prevalence.

5. *Develop and share clinical guidelines* for integrating H. pylori screening into routine care for patients with peptic ulcers, GERD, and gastritis symptoms.

6. *Support community hygiene programs* to encourage consistent hand washing practices and reduce H. pylori infection risks.

REFERENCES

● Akhtar, T., Sarwar, S., Ishfaq, A., & Haider, I. (2022). Incidence of Helicobacter pylori Infection in District Haripur Khyber Pakhtunkhwa. *Pakistan Journal of Medical & Health Sciences*, *16*(11), 70-70.

● Alam, M., Tahir, R., Ahmad, S., Amin, S., Zareen, A., & Khan, A. G. (2023). Frequency of Helicobacter pylori (H. Pylori) among patients presenting with duodenal perforation. *Pakistan Journal of Medical & Health Sciences*, *17*(03), 142-142.

● Anwar, P., Naeem, A., Khan, M., Arif, A., Zahid, A., & Wajid, U. (2023). Prevalence of Helicobacter pylori infections in patients visiting to gestroenterology department Rehman Medical Institute Khyber Pakhtunkhwa. *International Journal of Natural Medicine and Health Sciences*, *2*(4), 37-43.

● Crowe, S. E. (2019). Helicobacter pylori infection. *New England Journal of Medicine*, *380*(12), 1158-1165.

● De Brito, B. B., da Silva, F. A. F., Soares, A. S., Pereira, V. A., Santos, M. L. C., Sampaio, M. M., ... & de Melo, F. F. (2019). Pathogenesis and clinical management of Helicobacter pylori gastric infection. *World journal of gastroenterology*, *25*(37), 5578.

● FitzGerald, R., & Smith, S. M. (2021). An overview of Helicobacter pylori infection. *Helicobacter pylori*, 1-14.

● HABIB , T., KAINAT, ., AHMAD , Y., AHMAD , S., KHAN , S., ALI , L., NIQABULLAH, ., & UDDIN , M. (2024). FREQUENCY OF HELCIOBACTER PYLORI AMONGST PATIENTS WITH GASTROINTESTINAL TRACT SYMPTOMS. *Biological and Clinical Sciences Research Journal*, *2024*(1), 930. https://doi.org/10.54112/bcsrj.v2024i1.930.

● Haq, I., Muhammad, A., Fazli Zahir, M. K., Anwar, F., Akhtar, M. S., & Ullah, F. (2020). Serological and Epidemiology study of Helicobacter pylori infection among Dyspeptic patients in District Peshawar Pakistan. *Adv. Biores*, *11*(3), 81-85.S.

● Hassan, M. N., Arif, A., Shahzad, M. S., Ibrahim, M., Rahman, H. A., Razaq, M. A., & Ahmed, R. (2020). 88. Global prevalence of Helicobacter pylori and its effect on human health. *Pure and Applied Biology (PAB)*, *9*(1), 936-948.

● Hooi, J. K., Lai, W. Y., Ng, W. K., Suen, M. M., Underwood, F. E., Tanyingoh, D., ... & Ng, S. C. (2017). Global prevalence of Helicobacter pylori infection: systematic review and meta-analysis. *Gastroenterology*, *153*(2), 420-429.

● Hu, Y., Zhu, Y., & Lu, N. H. (2017). Novel and effective therapeutic regimens for Helicobacter pylori in an era of increasing antibiotic resistance. *Frontiers in cellular and infection microbiology*, *7*, 168.

● Malfertheiner, P., Camargo, M. C., El-Omar, E., Liou, J. M., Peek, R., Schulz, C., ... & Suerbaum, S. (2023). Helicobacter pylori infection. *Nature reviews Disease primers*, *9*(1), 19.

● Mehmood, K., Awan, A. A., Muhammad, N., Hasan, F., & Nadir, A. (2014). Helicobacter pylori prevalence and histopathological findings in dyspeptic

patients. *Journal of Ayub Medical College Abbottabad*, *26*(2), 182-185.

● Ren, S., Cai, P., Liu, Y., Wang, T., Zhang, Y., Li, Q., ... & Jin, G. (2022). Prevalence of Helicobacter pylori infection in China: A systematic review and meta-analysis. *Journal of gastroenterology and hepatology*, *37*(3), 464-470

● Shahzad, S., Tareen, K. A., Hyder, A., Ahmed, I., Siddiqui, M. K., Iqbal, S., ... & Yaseen, R. T. (2025). Helicobacter pylori infection as a cause of dyspepsia in the Pakistani population: an experience from a large tertiary care center. *Cureus*, *17*(1).

● Sun, Q., Yuan, C., Zhou, S., Lu, J., Zeng, M., Cai, X., & Song, H. (2023). Helicobacter pylori infection: a dynamic process from diagnosis to

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treatment. *Frontiers in cellular and infection microbiology*, *13*, 1257817.

● Ullah, O., Rahman, H., & Ijaz, S. (2025). Helicobacter pylori-Associated Infection: A Comprehensive Histopathological Analysis of Gastric Biopsies from Patients of Pakistan. *Microbiology Research*, *16*(11), 232.

● Zamani, M., Ebrahimtabar, F., Zamani, V., Miller, W. H., Alizadeh-Navaei, R., Shokri-Shirvani, J., & Derakhshan, M. H. (2018). Systematic review with meta-analysis: the worldwide prevalence of Helicobacter pylori infection. *Alimentary pharmacology & therapeutics*, *47*(7), 868-876.