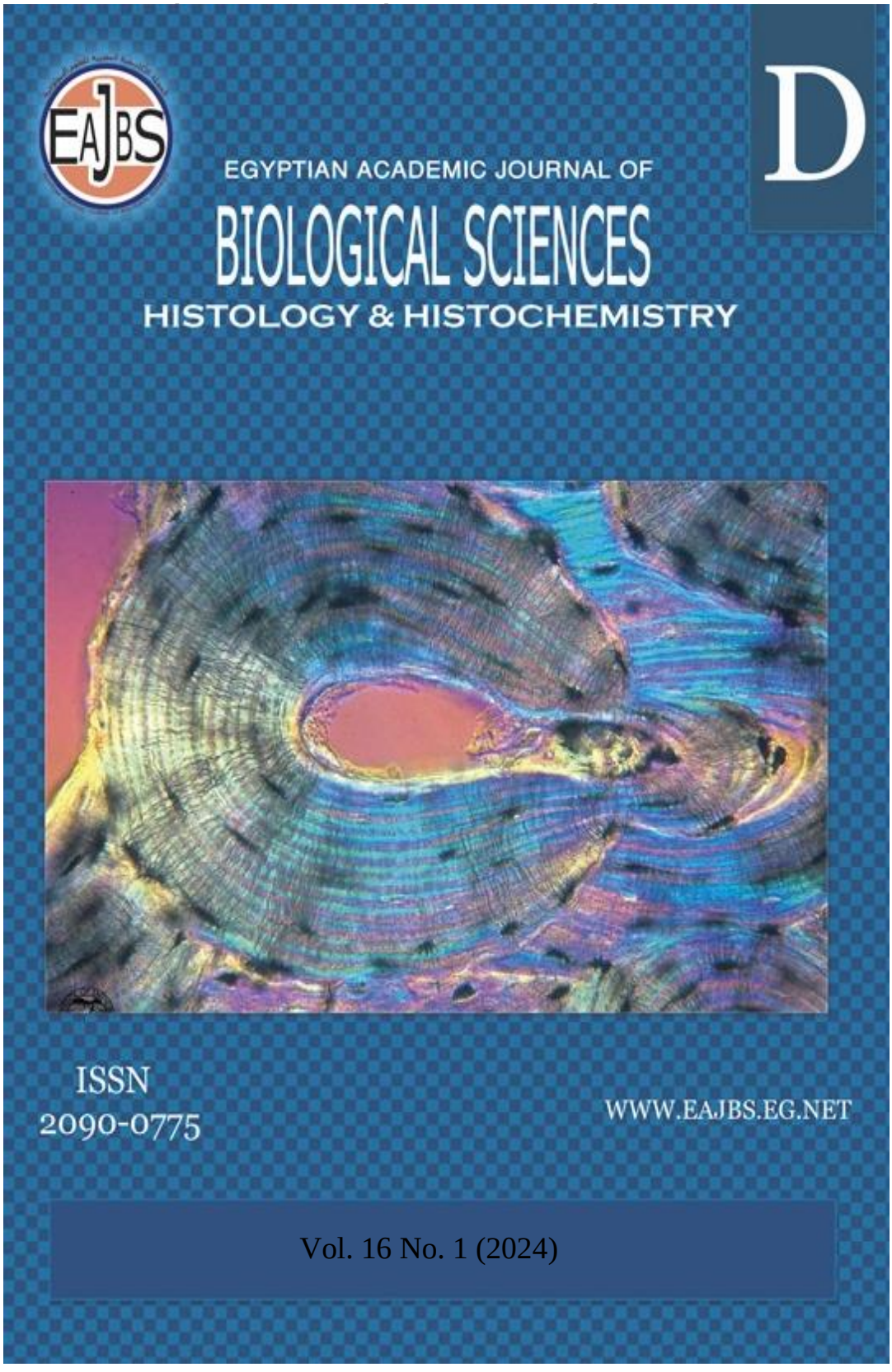

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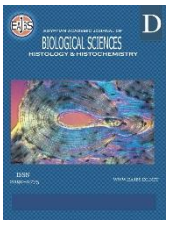

Public Awareness and Attitude Towards *Helicobacter pylori* Infection among Residents of Al-Baha Region, Saudi Arabia

Ramy H. Agwa[1]; Ahmed T.M. Elshennawy[2]; Mashael M. A. Alzahrani[3]; Haneen A. S. Al Omari[3]; Adwa A. M. Alzahrani[3]; Norah S. M. Alharthi[3] and Warda Othman[4]

[1]Internal Medicine Department, Faculty of Medicine, Al-Baha University, Al-Baha, Saudi Arabia.
Hepatology and Gastroenterology Unit, Internal Medicine Department, College of Medicine, Mansoura,University, Egypt.
[2]Anatomy Department, Faculty of Medicine, Al-Baha University, Al-Baha, Saudi Arabia.
[3]Graduate Student, Faculty of Medicine, Al-Baha University, Al-Baha, Saudi Arabia.
[4]Internal Medicine Department, Faculty of Medicine, Al-Baha University, Al-Baha, Saudi Arabia.
Department of Hepatology and Gastroenterology, National Liver Institute, Menoufia University, Shebeen El-Koum, Egypt.
***E-mail:** ahmadelshennawy@yahoo.com

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ABSTRACT

Introduction: *Helicobacter pylori* (*H. pylori*) is a common bacterial infection that can cause various digestive issues such as gastritis, peptic ulcers, and in some cases, stomach cancer. *H. pylori* is typically transmitted through contaminated food, water, or close contact with an infected person. Treatment usually involves a combination of antibiotics and acid-suppressing medications. This study aims to assess awareness of *H. pylori* infection among the residents in Al-Baha region, KSA by describing the pathogen, risk factors, diagnosis, treatment, prevention, and complications. **Methods:** A cross-sectional study included 424 residents in Al Baha, KSA through the distribution of an online questionnaire for English and Arabic-speaking citizens and residents aged 18 years or above and both sexes were invited to participate in this study. The data were extracted, reviewed, coded, and input into IBM SPSS version 28 for statistical analysis. **Results:** General knowledge about *H. pylori* was good, only 7 (1.7%) participants had not heard of it. 228 (53.77%) of the participants possessed a good level of awareness about *H. pylori* including its risk factors, diagnosis, treatment, and complications. Females have higher knowledge scores ($p = 0.022$). Older participants were more likely to have good awareness and attitudes toward *H. pylori* infection than younger participants ($p = 0.004$). **Conclusion:** In conclusion, the study results showed that public awareness in Al-Baha region regarding *H. pylori* infection was good. New education programs are required to raise awareness of this disease which could be easily avoided with prevention awareness, early detection, and intervention.

INTRODUCTION

Helicobacter pylori (*H. pylori*) is one of the most common bacterial pathogens that affected humans four decades ago. Currently, infection rates have decreased significantly due to the improvement in the standards of socioeconomic living and treatment of infected individuals led to reduced transmission (Katelaris, *et al.*, 2023).

A systematic review conducted in 2017 found that 65.9% of Saudis were infected with *H. pylori* (Hooi, *et al.*, 2017). However, it is important to note that only one study was utilized to represent the comprehensive results in Saudi Arabia.

H. pylori has a close relationship with some gastric diseases, such as chronic gastritis, and peptic ulcer, which can be complicated by bleeding and a highly increased risk of gastric cancer, so it is considered a group 1 carcinogen. Also, it is a risk for extra gastric diseases such as idiopathic thrombocytopenic purpura and sideropenic anemia (Diaconu, *et al.*, 2017; Zou, *et al.*, 2020).

People infected by *H. pylori* have a risk of gastric ulcer 1-3%, and gastric mucosa-associated lymphoid tissue lymphoma (MALToma), which develops in 0.1%. The gastric adenocarcinoma phenotype is more common when the stomach is affected by proximal colonization, known as pangastritis. This condition leads to harm in the gastric glands, resulting in atrophic gastritis and the presence of hydrochlorhydria or achlorhydria. It is characterized by reduced levels of pepsinogen I, elevated levels of gastrin, and a low pepsinogen I/II ratio. Over time, this phenotype advances through a series of stages, including intestinal metaplasia, dysplasia, and ultimately adenocarcinoma (Ahn, *et al.*, 2015).

The precise mechanisms and transmission routes for *H. pylori* infection have not been conclusively established. However, studies have indicated that H. pylori bacteria can be transmitted either directly from one person to another or indirectly from an infected individual to the environment. Person-to-person transmission can occur primarily through the fecal-oral or oral-oral routes (Mladenova, *et al.*, 2018). Fecal-oral transmission in general is uncommon (Dunn, *et al.*, 1997).

Several factors should be considered when selecting an appropriate method of *H. pylori* diagnosis, including cost, availability, clinical situation, prevalence of infection, pretest probability of infection, and age (Vilaichone, et al., 2006).

One way to classify the methods is based on whether or not an endoscopy is required. Biopsy-based tests, such as histological evaluation, culture, polymerase chain reaction (PCR), and the rapid urease test (RUT), fall into this category. Another approach is to use non-invasive methods, such as the urea breath test (UBT), serology, and stool antigen test (SAT) (Garza-González, *et al.*, 2014).

Treatment of *H. pylori* relies on a combination of antimicrobials such as clarithromycin, levofloxacin, and metronidazole plus antisecretory agents such as proton-pump inhibitors (PPIs). Antisecretory agents are required to increase the gastric pH. The elevation of the gastric pH by antisecretory agents is required for the bactericidal effect of the antimicrobial agents (Yang, *et al.*, 2014).

This study focuses on assessing awareness and attitude toward *H. pylori* infection, by describing the pathogen itself, risk factors, diagnostic tools, types of treatment, prevention methods, and complications among Al-Baha residents. The results could contribute to improving health services for better awareness.

MATERIALS AND METHODS

Study Design:

This is an observational cross-sectional community-based study that ran among Al-Baha population. The present study was developed through Systematic

random sampling, and a sample size of 435 participants who are living in Al-Baha region in Saudi Arabia (males and females) (Saudi and non-Saudi), aged 18 years old and above, and not new residents, to assess the awareness level towards *H. pylori* infection.

The data were collected online utilizing Google Forms. The study initially enrolled 435 participants, but only 424 participants met the inclusion criteria and were included in the final analysis. The remaining 11 participants were excluded from the study due to their refusal to provide consent or because they were working as healthcare providers (Fig. 1).

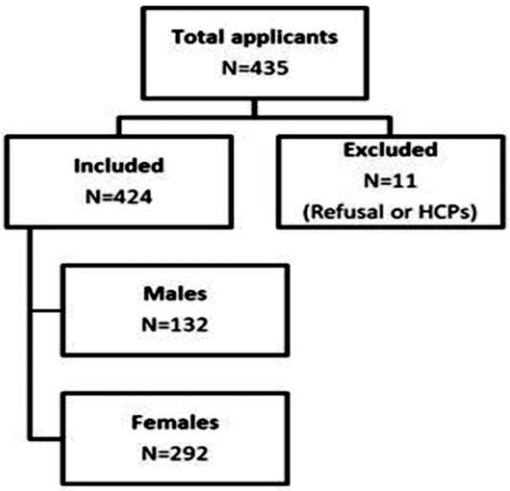

Fig. 1: Algorithm for patient inclusion and classification according to gender

Inclusion Criteria: Age above 18 years, male or female, Saudi and non-Saudi, Al-Baha residents, and including all ethnicities.

Exclusion Criteria: Non-Al-Baha residents age less than 18, new residents, and health care providers.

Sampling Technique and Size:

The sample size was determined using the Raosoft sample size calculator (Fig. 2); Using 5% as a margin of error 95% as a confidence interval, 50% as response distribution, and 466946 as population size according to the General Authority for Statistics, we assume that 384 participants would be adequate to ensure the generalizability of responses (Raosoft, 2004).

$$n = \frac{\left(\frac{z}{d}\right)^2 x(P)^2}{1 + \frac{1}{N}\left[\left(\frac{z}{d}\right)^2 x(P)^2 - 1\right]} = \frac{\left(\frac{1.96}{0.05}\right)^2 x(0.5)^2}{1 + \frac{1}{466946}\left[\left(\frac{1.96}{0.05}\right)^2 x(0.5)^2 - 1\right]} n$$

$$= \frac{1536.64\, x\, 0.25}{1 + \frac{1}{466946}[1536.64\, x 0.25 - 1]} n$$

$$= \frac{384.16}{1 + \frac{1}{466946}[383.16]} = 383.8450298$$

Fig. 2: Raosoft sample size calculation

* z = 1.96 for a 95% confidence level.
* p = 0.5 the prevalence of the condition (50%)
* d = the precision of the estimate (0.05)
* N = population size
* n = recommended sample size

Data Collection Tool and Technique:

The data were collected online by Google Forms. Participants completed an online questionnaire for about 3-5 minutes. The survey involved six parts. The first part was about patient demographics in the form of age, gender, nationality, and level of education. The other parts were related to awareness about *H. pylori* infection and its risk factors, symptoms, diagnosis, treatment, and complications.

Pilot Study:

A pilot study was performed to assess the internal consistency and reliability of the questionnaire using Cronbach's alpha. The results showed adequate internal consistency reliability with Cronbach's alpha = 0.68.

Data Analysis:

The data were extracted, reviewed, coded, and input into IBM SPSS, the twenty-eighth version to be analyzed statistically. All utilized statistical tests were two-tailed, and a P value of less than 0.05 was considered to be statistically significant.

To determine participants' level of awareness and attitude regarding *H. pylori*, an overall score was calculated by adding up the scores for each item. Scoring knowledge for each participant; questions were given one point for correct response (Yes) and zero points for incorrect answers (No, I don't know).

Also, scoring attitude for each participant; questions were given one point for correct response (Yes) and zero points for incorrect answers (No).

Score Grading:

Participants who got less than 60% of the maximum score were considered to have a poor knowledge/attitude level, while those who got 60% or more were considered to have a good knowledge/attitude level.

Descriptive analysis was utilized through frequency and distribution percentages for all variables, including participants' demographic information, education, and residence, and also to investigate the clinical symptoms, diagnosis, and treatment of *H. pylori* infection among study participants with previous diagnoses with *H. pylori*.

Additionally, participants' knowledge and perceptions regarding *H. pylori* were tabulated, and their overall awareness level and source of information were graphed.

A cross-tabulation graph was used to assess factors associated with participants' knowledge level about *H. pylori*. Pearson's chi-square test and exact probability test for small frequency distributions were performed.

RESULTS

Socio-Demographic Data of Study Participants:

Socio-demographic data were collected from the participants, which included their gender, age, nationality, residence, educational level, and occupational status. The results revealed that the majority of the participants were females, with 292 (68.9%) and 132 (31.1%) being males. In terms of age, the majority of participants (150 [35.4%]) aged 21-29 years, 84 participants (19.8%) aged 18-20 years, 75 participants (17.7%) aged 30-39 years, 89 participants (21.0%) aged 40-50 years, and 26 participants (6.1%) aged over 50 years. The majority of participants were Saudi, 412 participants (97.2%), and only 12 participants (2.8%) were non-Saudi. In terms of residence, Al Qara accounted for the largest group of participants (23.8%), followed by Al-Baha City (22.2%) and Al Makhwah (14.9%). In terms of educational level, the majority of participants (309 [72.9%]) had completed college or higher education, while 105 participants (24.8%) had completed secondary school. Only a small percentage of participants had completed primary (0.9%) or intermediate (1.2%) school or were able to read and write only (0.2%).

Regarding occupational status, 134 participants (31.6%) were working, similarly; the other 134 participants were students and 156 participants (36.8%) were unemployed (Table 1).

Table 1: Socio-demographic data of study participants

Socio-demographic Data	No	%
Gender		
Female	292	68.9%
Male	132	31.1%
Age		
18-20	84	19.8%
21-29	150	35.4%
30-39	75	17.7%
40-50	89	21.0%
50+	26	6.1%
Nationality		
Saudi	412	97.2%
Non-Saudi	12	2.8%
Residence		
Al-Bahah city	94	22.2%
Al-Hajrah	4	0.9%
Al-Aqiq	13	3.1%
Al-Qara	101	23.8%
Al-Makhwah	63	14.9%
Al-Mandaq	58	13.7%
Baljurashi	46	10.8%
Bani-Hasan	17	4.0%
Ghamid Alzinad	18	4.2%
Qilwah	10	2.4%
Educational Level		
Illiterate	1	0.2%
Primary school	4	0.9%
Intermediate school	5	1.2%
Secondary school	105	24.8%
College and above	309	72.9%
Occupational Status		
Student	134	31.6%
Working	134	31.6%
Not working	156	36.8%

Clinical Symptoms, Diagnosis, And Treatment of Study Participants with Current or Previous *H. pylori* Exposure:

Of 424 subjects included in this study, 144 participants (34.0%) reported current or previous *H. pylori* infection, while 280 participants (66.0%) reported no current or previous *H. pylori* infection. Among those who reported current or previous *H. pylori* infection, the most common clinical symptom was abdominal distension with 122 participants (84.7%), followed by abdominal pain (74.3%), feeling of heartburn (56.3%), nausea (52.1%), loss of appetite (48.6%), diarrhea (34.7%), constipation (31.9%), vomiting (21.5%), and general fatigue (2.1%).

The most commonly performed diagnostic test was stool analysis, performed on 63 participants (43.8%), followed by blood tests, performed on 46 participants (31.9%), gastroscopy, performed on 44 participants (30.6%), and urea breath test, performed on 41 participants (28.5%). Only 2 participants (1.4%) had symptoms suggestive of *H. pylori* infection but did not perform a diagnostic test.

Regarding treatment, among the 144 participants (34.0%) who reported current or previous H. pylori infection; 114 participants (79.2%) received treatment for *H. pylori* infection, while 30 participants (20.8%) did not receive treatment. Of the 144 participants who reported current or previous *H. pylori* infection, 107 participants (74.3%) reported improvement, while 37 participants (25.7%) did not report any improvement (Table 2). Regarding relatives' exposure to *H. pylori* infection; 330 participants (77.8%) reported knowing someone who is suffering from *H. pylori* infection, while 94 participants (22.2%) reported not knowing anyone suffering from this infection (Table 2).

Table 2: Clinical symptoms, diagnosis, and treatment of study participants with current or previous *H. pylori* exposure

Previous Exposure	**Have you ever suffered or you are currently suffering from *H. pylori*?**	**No**	**%**
	Yes	144	34.0%
	No	280	66.0%
Symptoms	**Have you experienced an Abdominal Distension?**		
	Yes	122	84.7%
	No	22	15.3%
	Have you experienced Diarrhea?		
	Yes	50	34.7%
	No	94	65.3%
	Have you experienced Nausea?		
	Yes	75	52.1%
	No	69	47.9%
	Have you experienced Feelings of Heartburn?		
	Yes	81	56.3%
	No	63	43.8%
	Have you experienced a Loss of Appetite?		
	Yes	70	48.6%
	No	74	51.4%
	Have you experienced Abdominal Pain?		
	Yes	107	74.3%
	No	37	25.7%
	Have you experienced Constipation?		
	Yes	46	31.9%
	No	98	68.1%
	Have you experienced Vomiting?		
	Yes	31	21.5%
	No	113	78.5%
	Others: General Fatigue		
	Yes	3	2.1%
	No	141	97.9%
Diagnosis	**Gastroscopy**		
	Yes	44	30.6%
	No	100	69.4%
	Urea Breath Test		
	Yes	41	28.5%
	No	103	71.5%
	Blood Tests		
	Yes	46	31.9%
	No	98	68.1%
	Stool Analysis		
	Yes	63	43.8%
	No	81	56.3%
	Clinical Presentation		
	Yes	2	1.4%
	No	142	98.6%
Treatment	**Has the right medicine been taken?**		
	Yes	114	79.2%
	No	30	20.8%
Improvement	**Has the condition improved**?		
	Yes	107	74.3%
	No	37	25.7%
Relatives Exposure	**Do you know any of your relatives or friends suffering from *H. Pylori* infection?**		
	Yes	330	77.8%
	No	94	22.2%

Sources of Information Among Study Participants:

Based on the data analysis, 417 participants (98.3%) reported having known about *H. pylori*, while only 7 participants (1.7%) reported not having heard of it. Among those who reported knowing about *H. pylori*, 289 participants (69.3%) reported learning about *H. pylori* from family and friends. This was followed by social media, with 176 participants (42.2%), work was the source of information for 61 participants (14.6%), health care staff for 35 participants (8.4%), and the internet for another 35 participants (8.4%).

Education was the least common source of information, with only 12 participants (2.9%) reporting this as a source of information (Table 3).

Table 3: Sources of information among study participants.

What is the source of information?	***Family and Friends***	**No**	**%**
	Yes	289	69.3%
	No	128	30.7%
	Work		
	Yes	61	14.6%
	No	356	85.4%
	Social media		
	Yes	176	42.2%
	No	241	57.8%
	Health care staff		
	Yes	35	8.4%
	No	382	91.6%
	Education		
	Yes	12	2.9%
	No	405	97.1%
	Internet		
	Yes	35	8.4%
	No	382	91.6%

Public Awareness and Attitude Towards *Helicobacter pylori* Infection Among Al-Baha Residents:

It appears that the majority of participants were aware that abdominal pain (67.9%), abdominal cramping or bloating (57.1%), vomiting, nausea, frequent burping (64.9%), heartburn, and loss of appetite (68.2%), and certain changes in the stool such as diarrhea or constipation (50.9%) could be symptoms of *H. pylori* infection. While a significant proportion of participants did not know whether certain changes in stool (45.3%), could be symptoms of *H. pylori* infection.

In terms of transmission, most participants were aware that not washing hands before eating could cause *H. pylori* (69.1%) and that some types of contaminated food and water could also cause *H. pylori* (86.3%). Regarding the potential health risks associated with *H. pylori* infection, most participants were aware that *H. pylori* could cause an increased risk of stomach ulcers (74.5%) and inflammation of the stomach lining (57.8%). However, fewer participants were aware that *H. pylori* could also cause an increased risk of stomach cancer (40.1%).

When it comes to diagnosis, the most commonly known methods were gastroscopy (58.0%), urea breath test (41.0%), and stool analysis (52.8%). Fewer participants were aware of blood tests (33.5%) as a diagnostic method. Concerning treatment, the majority of participants believed that *H. pylori* requires going to the hospital to request diagnosis and treatment (92.0%).

Antibiotics were the most commonly known treatment (57.1%), followed by proton pump inhibitors (16.7%) and acid blockers (16.5%). Fewer participants stated that no treatment option (2.6%), (Table 4).

Table 4: Public awareness and attitude towards *Helicobacter pylori* infection among Al Baha residents.

Clinical Symptoms	***Have you ever heard of H. pylori?***	**No**	**%**
	Yes	417	98.3%
	No	7	1.7%
	Is abdominal pain, a symptom of H. pylori infection?		
	Yes	288	67.9%
	No	19	4.5%
	I don`t know	117	27.6%
	Is abdominal cramping, or bloating a symptom of H. pylori infection?		
	Yes	242	57.1%
	No	18	4.2%
	I don`t know	164	38.7%
	Are vomiting, nausea, and frequent burping a symptom of H. pylori?		
	Yes	275	64.9%
	No	32	7.5%
	I don`t know	117	27.6%
	Is heartburn, and loss of appetite a symptom of H. Pylori?		
	Yes	289	68.2%
	No	12	2.8%
	I don`t know	123	29.0%
	is any change in stool like diarrhea or constipation or change in color a symptom of H. pylori?		
	Yes	216	50.9%
	No	16	3.8%
	I don`t know	192	45.3%
	To your knowledge, not washing hands before eating may cause H. pylori ?		
	Yes	293	69.1%
	No	33	7.8%
	I don`t know	98	23.1%
	To your knowledge, do some types of contaminated food and water cause H. pylori?		
	Yes	366	86.3%
	No	6	1.4%
	I don`t know	52	12.3%
	Do you think that H. pylori causes an increased risk of stomach ulcers?		
	Yes	316	74.5%
	No	6	1.4%
	I don`t know	102	24.1%
	Do you think that H. pylori causes an increased risk of stomach cancer?		
	Yes	170	40.1%
	No	39	9.2%
	I don`t know	215	50.7%
	Do you think that H. pylori causes an increased risk of inflammation of the stomach lining?		
	Yes	245	57.8%
	No	14	3.3%
	I don`t know	165	38.9%
Diagnosis	***Gastroscopy***		
	Yes	246	58.0%
	No	178	42.0%
	Urea breath test		
	Yes	174	41.0%
	No	250	59.0%
	Blood Tests		
	Yes	142	33.5%
	No	282	66.5%

	Stool Analysis		
	Yes	224	52.8%
	No	200	47.2%
	I don't know		
	Yes	69	16.3%
	No	355	83.7%
Treatment	***Do you think that H. pylori requires going to the hospital to request diagnosis and treatment?***		
	Yes	390	92.0%
	No	6	1.4%
	I don`t know	28	6.6%
	Antibiotics		
	Yes	242	57.1%
	No	182	42.9%
	Proton pump inhibitors		
	Yes	71	16.7%
	No	353	83.3%
	Acid blockers		
	Yes	70	16.5%
	No	354	83.5%
	No treatment		
	Yes	11	2.6%
	No	413	97.4%
	I don't know		
	Yes	155	36.6%
	No	269	63.4%

Public Awareness Level Towards *Helicobacter pylori* Infection Among Al-Baha Residents:

Based on the analysis of the overall public awareness level toward H. pylori infection among Al-Baha residents, the results indicate that 53.77% of the participants had a good level of awareness. On the other hand, 46.23% of the participants had a poor level of awareness (Table 5).

Table 5: Level of public awareness of *Helicobacter pylori* infection among Al-Baha residents

*	**Frequency**	**%**
Good	228	53.77%
Poor	196	46.23%
Total	424	100%

* Participants who scored less than 60% of the maximum score were classified as having a poor awareness level, while those who scored 60% or more were classified as having a good awareness level.

Public Attitude Level Towards *Helicobacter pylori* Infection Among Al-Baha Residents:

Based on the analysis of the overall public attitude level toward *H. pylori* infection among Al-Baha residents, the results indicate that 55.66% of the participants were classified as having a good level of attitude. Conversely, 44.34% of the participants were classified as having a poor level of attitude (Table 6).

Table 6: Public attitude level towards *Helicobacter pylori* infection among Al-Baha residents**.**

*	**Frequency**	**%**
Good	236	55.66%
Poor	188	44.34%
Total	424	100%

* Participants who scored less than 60% of the maximum score were classified as having a poor attitude level, while those who scored 60% or more were classified as having a good attitude level.

Overall public awareness and attitude level towards *Helicobacter pylori* infection among Al-Baha residents:

Based on the data analysis, it appears that the overall level of public awareness and attitude toward *H. pylori* infection among Al-Baha residents is fairly balanced. Specifically, 215 participants (50.7%) were classified as having good awareness and attitude levels, while 209 participants (49.3%) were classified as having poor awareness and attitude levels (Table 7).

Table 7: Overall public awareness and attitude level towards *Helicobacter pylori* infection among Al-Baha residents**.**

*	**Frequency**	**%**
Good	215	50.7%
Poor	209	49.3%
Total	424	100%

* Participants who scored less than 60% of the maximum score were classified as having a poor awareness/attitude level, while those who scored 60% or more were classified as having a good awareness/attitude level.

Factors associated with overall public awareness and attitude level towards *Helicobacter pylori* infection among Al-Baha residents:

Firstly, gender was found to be a significant factor, with a chi-square P value of 0.022. Specifically, female participants were more likely to have good awareness and attitudes toward *H. pylori* infection than male participants.

Secondly, age was also found to be a significant factor, with a chi-square P value of 0.004. Specifically, older participants were more likely to have good awareness and attitudes toward H. pylori infection than younger participants.

Thirdly, nationality was found to be a significant factor, with a chi-square P value of 0.017. Specifically, Saudi Arabian participants were more likely to have good awareness and attitudes toward *H. pylori* infection than non-Saudi participants. Fourthly, educational level was found to be a significant factor, with a chi-square P value of less than 0.001.

Specifically, participants with higher levels of education were more likely to have good awareness and attitudes toward *H. pylori* infection than those with lower levels of education.

Finally, occupational status was also found to be a significant factor, with a chi-square P value of 0.011. Specifically, participants who were employed were more likely to have good awareness and attitudes toward *H. pylori* infection than those who were unemployed. However, residence was not found to be a significant factor, with a chi-square P value of 0.439 (Table 8).

Table 8: Personal data and overall awareness & attitude level

Personal data	Overall Awareness and Attitude Level				p-value
	Poor		Good		
	No	%	No	%	
Gender					
Female	133	45.5%	159	54.5%	0.022
Male	76	57.6%	56	42.4%	
Age					
18-20	41	48.8%	43	51.2%	
21-29	61	40.7%	89	59.3%	0.004
30-39	48	64.0%	27	36.0%	
40-50	41	46.1%	48	53.9%	
50+	18	69.2%	8	30.8%	
Nationality					
Saudi	199	48.3%	213	51.7%	0.017
Non-Saudi	10	83.3%	2	16.7%	
Residence					
Al-Bahah	39	41.5%	55	58.5%	
Al-Hajrah	2	50.0%	2	50.0%	
Al-Aqiq	7	53.8%	6	46.2%	
Al-Qara	52	51.5%	49	48.5%	
Al-Mkhwah	36	57.1%	27	42.9%	0.439
Al-Mandq	30	51.7%	28	48.3%	
Baljurashi	17	37.0%	29	63.0%	
Bani-Hasan	11	64.7%	6	35.3%	
Ghamid Alzinad	10	55.6%	8	44.4%	
Qilwah	5	50.0%	5	50.0%	
Educational Level					
Illiterate	1	100.0%	0	0.0%	
Primary school	4	100.0%	0	0.0%	< **0.001**
Intermediate school	1	20.0%	4	80.0%	
Secondary school	67	63.8%	38	36.2%	
College and above	136	44.0%	173	56.0%	
Occupational Status					
Student	52	38.8%	82	61.2%	**0.011**
Working	70	52.2%	64	47.8%	
Not working	87	55.8%	69	44.2%	

DISCUSSION

H. pylori is one of the most common pathogens affecting humans with many complications including gastritis, peptic ulcer disease, and gastric cancer. So, assessment of awareness about *H. pylori* is an important healthcare topic to help to improve general knowledge about the disease in a trial to decrease its complications. In general, many factors affect the level of awareness, and in our study the results were acceptable, the highest percentage of awareness and knowledge was reported among middle-aged, educated people. Regarding gender, women showed a higher awareness level toward infection than men.

Previous studies as regards knowledge of general populations about *H. pylori* were little, especially in Saudi Arabia, which recommending to conduct more studies to explore different methods to prevent this infection and its complications.

The present study is considered the first of its kind in Al-Baha to report the level of awareness about *H. pylori* infection and its predictors. The present study involved 424 respondents from all

Al-Baha populations aged 18 years or above. In general, Al-Baha population reports a good level of awareness of *H. pylori* infection. The responses expressed a good awareness as regards the nature of H. pylori, organs involved by *H. pylori*, signs and symptoms of the disease, the effective treatment and diagnosis, and general knowledge about the disease prevalence in Al-Baha. In agreement with our study, Al Ghadeer *et al.* (2021) and Abdelrahman *et al.* (2024), conducted a cross-sectional study in Al-Ahsa region - eastern, and Riyadh region - central, respectively, Saudi Arabia, which revealed 54.9% and 53.47% respectively of participants showed a good level of awareness and attitude about *H. pylori* infection as regards risk factors, symptoms, diagnosis, complications, and treatment.

In Contrary to the present study, a descriptive cross-sectional study conducted at King Saud University, Riyadh, Saudi Arabia, compared the awareness about *H. pylori* through health science and non-health science undergraduate students in Saudi Arabia and showed that the overall level of awareness was poor among both groups (Taghreed, *et al.*, 2021).

These findings were similar to those reported among physicians and students in a national survey in China (Wu, et al., 2020). About half of the participants of the present study were aware that persistent *H. pylori* infection may lead to gastric and duodenal ulcers and gastric cancer. The present study showed better awareness in comparison to some previous studies conducted in Jordan and the United Arab Emirates (Malek, *et al.,* 2021; Alaridah, *et al.*, 2023).

Some socio-demographic characteristics were expressed a connection with a high level of awareness in this study. Females have scored better information about *H. pylori* infection than males. This finding is consistent with some previous studies (Malek, *et al.,* 2021; Alaridah, *et al.*, 2023) and might be because women often are considered caregiver family members, and acquaint more interactions with clinicians to learn about diseases and their causes and prevention.

A higher level of awareness of *H. pylori* was expressed in the present study among those with higher education levels as well as those working in the medical field, which had been documented in some previous studies in Africa and South America (Abongwa, et al., 2017; Alves de Oliveira Serra. *et al.*, 2020).

In the current study, respondents who had a history of *H. pylori* infection or had family members diagnosed with this infection before tended to have better awareness, a finding that was reported in a previous study in Jordan (Alaridah, *et al.,* 2023). Using non-medical sources which were the dominating sources shown in the present study, may lead to ambiguity, false information, and failure to satisfy the patient's curiosity.

Strengths and limitations:

Favoringly, the present study is considered the first one conducted among Al-Baha population as regards the level of awareness about *H. pylori*. A disadvantage of the present study may be considered is the absence of a face-to-face manner, which reduces the response rate and increases participation bias.

Self-reported data such as the history of *H. pylori* infection among participants and their families might make the findings susceptible to recall bias. Recall bias showed up in many fields and the issue of self-reporting bias represented a key problem and a limitation to the study.

Future study:

Future research should focus on the prevalence of antibiotic resistance of *H. pylori* strains in Al-Baha population and the causes that prevent commitment to the treatment course of *H. pylori* that can help to get the best treatment effectiveness.

Conclusions

In Al-Baha, the general public awareness and attitude level toward H. pylori infection is fairly balanced. Specifically, 215 participants (50.7%)

were classified as having good awareness and attitude levels, while 209 participants (49.3%) were classified as having poor awareness and attitude levels.

The result of this study can be considered a starting point to device new education programs and campaigns that develop and raise awareness of this disease which would effectively implement population-based *H. pylori* screening and treatment programs.

Ethical Statement: Ethical approval was taken from the Research Ethics Committee of Al-Baha Faculty of Medicine number REC/MED/BU-FM/2023-43. **Acknowledgments:** We acknowledge all participants in this work.

Author contribution: Dr. Ramy and Dr. Elshennawy contributed to the design of the study and the interpretation of the data, Writing – Original Draft. Dr. Warda O., Mashael, Haneen, Adwa, and Norah were involved in data collection, writing the review & editing of the work.

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ARABIC SUMMARY

الوعي العام والموقف تجاه عدوى الملوية البوابية بين سكان منطقة الباحة بالمملكة العربية السعودية

رامي حسن عجوة [1] ; أحمد توفيق محمود الشناوى [2] ؛ مشاعل ماجد عبد الوهاب الزهراني [3] ؛ حنين أحمد سعيد العمري [3] ; اضواء عبد الله محمد الزهراني [3] ; نورة سعيد محمد أحمد الحارثي [3] ; وردة عثمان [4]

1- قسم الطب الباطني، كلية الطب، جامعة الباحة، الباحة، المملكة العربية السعودية.
وحدة أمراض الكبد والجهاز الهضمي، قسم الطب الباطني، كلية الطب، جامعة المنصورة، مصر.
2- قسم التشريح، كلية الطب، جامعة الباحة، الباحة، المملكة العربية السعودية.
3- طالبة تخرج، كلية الطب، جامعة الباحة، الباحة، المملكة العربية السعودية.
4- قسم الطب الباطني، كلية الطب، جامعة الباحة، الباحة، المملكة العربية السعودية.
قسم أمراض الكبد والجهاز الهضمي، معهد الكبد القومي، جامعة المنوفية، شبين الكوم، مصر.

مقدمة: الملوية البوابية *(H. pylori)* هي بكتيريا تسبب عدوى شائعة ويمكن أن تسبب مشاكل هضمية مختلفة مثل التهاب المعدة والقرحة الهضمية وفي بعض الحالات سرطان المعدة. تنتقل الملوية البوابية عادةً عن طريق الطعام أو الماء الملوث أو الاتصال الوثيق بشخص مصاب. يتضمن العلاج عادةً مزيجًا من المضادات الحيوية والأدوية المثبطة للحمض. تهدف هذه الدراسة إلى تقييم الوعي بعدوى الملوية البوابية بين سكان منطقة الباحة بالمملكة العربية السعودية من خلال وصف العامل الممرض وعوامل الخطر والتشخيص والعلاج والوقاية والمضاعفات.

الطرق: شملت دراسة مقطعية 424 مقيماً في الباحة بالمملكة العربية السعودية من خلال توزيع استبيان عبر الإنترنت للمواطنين والمقيمين الناطقين باللغة الإنجليزية والعربية الذين تبلغ أعمارهم 18 عامًا أو أكثر، وتمت دعوة كلا الجنسين للمشاركة في هذه الدراسة. تم استخراج البيانات ومراجعتها وترميزها وإدخالها في الإصدار 28 من برنامج IBM SPSS للتحليل الإحصائي.

النتائج: المعرفة العامة حول الملوية البوابية كانت جيدة، ولم يسمع عنها سوى 7 (1.7%) من المشاركين. كان لدى 228 (53.77%) من المشاركين مستوى جيد من الوعي حول الملوية البوابية بما في ذلك عوامل الخطر والتشخيص والعلاج والمضاعفات. تتمتع الإناث بدرجات معرفة أعلى (قيمة الاحتمال = 0.022). كان المشاركون الأكبر سنا أكثر عرضة للوعي الجيد والمواقف تجاه عدوى الملوية البوابية مقارنة بالمشاركين الأصغر سنا (قيمة الاحتمال = 0.004).

الخلاصة: في الختام، أظهرت نتائج الدراسة أن الوعي العام في منطقة الباحة فيما يتعلق بعدوى الملوية البوابية كان جيداً. هناك حاجة إلى برامج تثقيفية جديدة لرفع مستوى الوعي بهذا المرض الذي يمكن تجنبه بسهولة من خلال الوعي الوقائي والكشف المبكر والتدخل.