

BMJ Open Barriers to *Helicobacter pylori* management among the regular health screening population at a tertiary hospital healthcare centre in China: results from a qualitative analysis

Zhenzhen Wang , Chenli Zhang, Jie Jiang 

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Department of General Medicine / Internal Medicine, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

Correspondence to

Dr Jie Jiang;
croissantj@126.com and
Dr Chenli Zhang;
zcl10678@rjh.com.cn

ABSTRACT

Objectives We aimed to better understand patients' perspectives on *Helicobacter pylori* (*H. pylori*) treatment to develop tailored interventions for improving adherence.

Design We conducted a qualitative study using semi-structured, in-depth interviews from September to December 2024.

Setting The study was conducted at a large, university-affiliated healthcare centre which provides comprehensive health check-up services to a geographically diverse adult population.

Participants Individuals aged between 35 and 65 years old who had tested positive for *H. pylori* infection by 13C urea breath test in two consecutive annual health screenings and who had received their most recent *H. pylori* screening results within the past 6 months were enrolled.

Results Of the 23 participants involved in this study, 13 (56.5%) were male, with age ranging from 39 to 62 years. Five key themes emerged from the analysis: (1) Participants perceived *H. pylori* as common but not serious, with limited understanding of its association with gastric cancer, (2) Physician recommendations and familial concerns acted as primary cues to treatment initiation, (3) Barriers included low perceived severity, reinfection concerns, side effects, time constraints and absence of symptoms or family history, (4) Adherence was challenged by treatment side effects and lack of follow-up testing and (5) Despite low treatment completion, participants reported engaging in preventive behaviours such as using separate utensils and reducing dining out.

Conclusions Barriers to *H. pylori* eradication among health screening populations are multifaceted, involving informational deficits, cultural dining norms and logistical hurdles. Interventions should enhance physician-patient communication, emphasise follow-up testing and address misconceptions about reinfection and disease risk. Strengthening general practitioners' capacity for evidence-based *H. pylori* management and integrating post-screening educational support are essential for improving eradication rates and reducing infection-related morbidity.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The use of individual semi-structured interviews facilitated data triangulation and a comprehensive exploration of participant perspectives.
- ⇒ Data collection and analysis followed a rigorous thematic approach, with recruitment continuing until theoretical saturation was achieved.
- ⇒ The study was limited to a single healthcare centre in China, which may affect the transferability of the findings to different regional or cultural contexts.
- ⇒ Recruitment was restricted to participants aged 39–62 years, meaning that the specific barriers encountered by younger or elderly populations were not captured.

BACKGROUND

Helicobacter pylori (*H. pylori*) infection affects more than half of the global population and is a well-established cause of gastric cancer, the fifth most common malignancy and the third leading cause of cancer-related mortality worldwide.¹ In addition to its oncogenic potential, *H. pylori* is implicated in a variety of gastrointestinal (GI) and extra-GI disorders, placing a substantial burden on global health systems and contributing significantly to healthcare expenditures.² Consequently, leading clinical guidelines recommend eradication therapy for all individuals diagnosed with *H. pylori* infection, unless specific contraindications are present, to reduce infection rates and prevent associated disease development.^{2–5}

Individuals undergoing routine health screenings constitute an important target population for *H. pylori* control efforts, as they maintain regular contact with the healthcare system and present valuable opportunities for early detection and intervention. However, findings from a 3year follow-up study indicated that approximately 15% of

individuals with positive *H. pylori* results during health check-ups remained untreated or experienced eradication failure.⁶ Despite this significant gap in management, qualitative research exploring patients' lived experiences with *H. pylori*—including their perceptions, motivations and barriers to treatment—remains scarce. This lack of insight hampers the development of patient-centred strategies aimed at improving eradication rates.

To address this critical gap, we conducted a qualitative study employing an interpretive descriptive approach to explore the barriers and facilitators of *H. pylori* management among individuals undergoing regular health screening. By focusing on patients' perspectives and the sociocultural factors influencing their decision-making, we aim to generate actionable knowledge to enhance treatment uptake and inform targeted healthcare strategies.

METHODS

Study design

The reporting of this study adheres to the consolidated criteria for reporting qualitative research guidelines.⁷ We adopted an interpretive descriptive methodology to gain an in-depth understanding of patients' perceptions, motivations and barriers regarding *H. pylori* eradication therapy.⁸ The study protocol was reviewed and approved by the Ethics Committee of Ruijin Hospital, Shanghai Jiao Tong University School of Medicine. All participants provided either verbal or written informed consent prior to participation and received a complimentary speciality consultation as compensation. For participants who were unwilling or unable to participate in face-to-face interviews, we obtained oral informed consent at the initial telephone contact; these participants were then invited to sign the written informed consent form during their subsequent speciality consultation visits.

Study setting and participants recruitment

The study was conducted at a large, university-affiliated healthcare centre in Shanghai, China, which provides comprehensive health check-up services to a geographically diverse adult population. Participants were eligible for the study if they (1) Were aged between 35 and 65 years old, (2) Tested positive for *H. pylori* infection via a non-invasive screening, specifically 13C urea breath test (13C-UBT) in two consecutive annual health screenings and who had received their most recent *H. pylori* screening results within the past 6 months and (3) Were fluent in Mandarin. The 6 month timeframe was selected to minimise recall bias.⁹ Participants would be excluded if they (1) Had previous history of gastric surgery, (2) Had serious cognitive impairment and (3) Were currently pregnant or lactating (as this affects treatment options).

Eligible individuals were initially identified through the healthcare centre's database. A trained research coordinator contacted potential candidates by telephone,

explained the study purpose and procedures, and invited them to participate.

Purposive sampling was employed to ensure a diverse range of perspectives across different demographic characteristics, including age, sex and previous experience with *H. pylori* treatment. Recruitment continued until thematic saturation was achieved, defined as the point at which no new themes emerged from successive interviews.

Data collection

A semi-structured interview guide (online supplemental material 1) was developed by a gastroenterologist with expertise in *H. pylori* management. The guide included open-ended questions and prompts exploring participants' knowledge, attitudes, decision-making processes, treatment experiences and perceived barriers or facilitators to *H. pylori* eradication. The interview guide was pilot-tested with three participants and refined accordingly.

Interviews were conducted between September and December 2024 by an experienced female moderator (ZW) who specialises in General Practice and holds a doctoral degree in Gastroenterology. There was no prior established relationship between the interviewer and the participants before the study commenced. Participants could choose between face-to-face interviews at the healthcare centre or telephone interviews to enhance convenience and flexibility. All interviews were conducted in private settings to ensure confidentiality, and each session began with a detailed introduction to the study aims and procedures. The interviews lasted a mean of 33 min (range: 28–36 min).

With participants' permission, interviews were audio-recorded and supplemented with field notes. Basic demographic and clinical information was retrieved from the healthcare centre's electronic medical record system and verified during the interview.

Data analysis

All audio recordings were transcribed verbatim by two trained researchers (ZW and JJ). Transcripts were reviewed for accuracy by a third researcher (CZ). Data were managed and analysed using NVivo V.15 (QSR International, Melbourne, Australia). Thematic analysis was performed following Braun and Clarke's six-phase framework. The thematic analysis was applied to identify, analyse and report themes within data.¹⁰ Two researchers (ZW and JJ) independently coded the first two transcripts and collaboratively developed a preliminary coding framework. One researcher (ZW) subsequently coded the remaining transcripts using this framework, and regular meetings were held to refine codes and themes. Any discrepancies were resolved through discussion and consensus, with input from the third investigator (CZ) when necessary.

Concurrent data collection and analysis were performed iteratively to identify areas for exploration in the subsequent interview and to determine whether the data was saturated. Recruitment ceased once data saturation was

Table 1 Characteristics of participants

ID	Sex	Age	Clinical symptoms	Family history of gastric cancer	Habit of regular health check-up	Experience of <i>H. pylori</i> eradication
One-on-one telephone interview participants (n=13, 56.5%)						
1	Male	40s	No	Yes	Yes	No
2	Female	50s	No	No	Yes	Yes
3	Female	40s	No	No	Yes	No
4	Female	50s	No	Yes	Yes	Yes
5	Male	50s	Yes	No	Yes	Yes
6	Male	60s	No	No	Yes	Yes
7	Male	30s	No	Yes	Yes	Yes
8	Male	60s	No	No	Yes	Yes
9	Female	40s	No	No	Yes	No
10	Male	50s	No	No	Yes	No
11	Female	40s	No	No	Yes	No
12	Male	50s	No	No	Yes	No
13	Female	40s	Yes	No	Yes	Yes
Face-to-face interview participants (n=10, 43.5%)						
14	Female	50s	No	No	Yes	Yes
15	Male	40s	No	No	Yes	Yes
16	Female	50s	No	No	Yes	Yes
17	Male	40s	No	No	Yes	No
18	Male	40s	No	No	Yes	No
19	Male	40s	No	No	Yes	No
20	Female	50s	No	Yes	Yes	Yes
21	Male	60s	No	No	Yes	No
22	Male	60s	No	No	Yes	No
23	Female	50s	Yes	No	Yes	Yes
H. pylori, <i>Helicobacter pylori</i> .						

achieved after 23 interviews; two additional interviews were conducted thereafter to confirm saturation.

Patient and public involvement

Patients and the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Participant characteristics

Among the 31 eligible individuals contacted, 8 declined participation due to scheduling conflicts or reluctance to engage in telephone interviews. Ultimately, 23 participants completed the study, with 10 participating in face-to-face interviews and 13 participating via telephone (table 1). Participants' ages ranged from 39 to 62 years, and 56.5% (13/23) were male. Twelve participants (52.2%) had attempted *H. pylori* eradication therapy, although two discontinued the treatment prematurely due to adverse effects. Only one participant underwent

a follow-up *H. pylori* test within 3 months after treatment completion.

Thematic analysis revealed five major themes regarding *H. pylori* management experiences among the health screening population: (1) Perceptions of *H. pylori* infection and sources of information, (2) Cues to action for treatment, (3) Perceived barriers to treatment initiation, (4) Adherence challenges during treatment and (5) Adoption of preventive strategies (figure 1).

Theme 1: perception of *H. pylori* infection and source of information

Perception of *H. pylori* infection

Most participants were aware of the high prevalence of *H. pylori* infection but generally perceived it as a minor or common issue. Only a few participants recognised its potential link to gastric cancer, which significantly influenced their willingness to seek treatment.

I don't know much about *H. pylori*—it's just something I've heard about occasionally. Since I'm

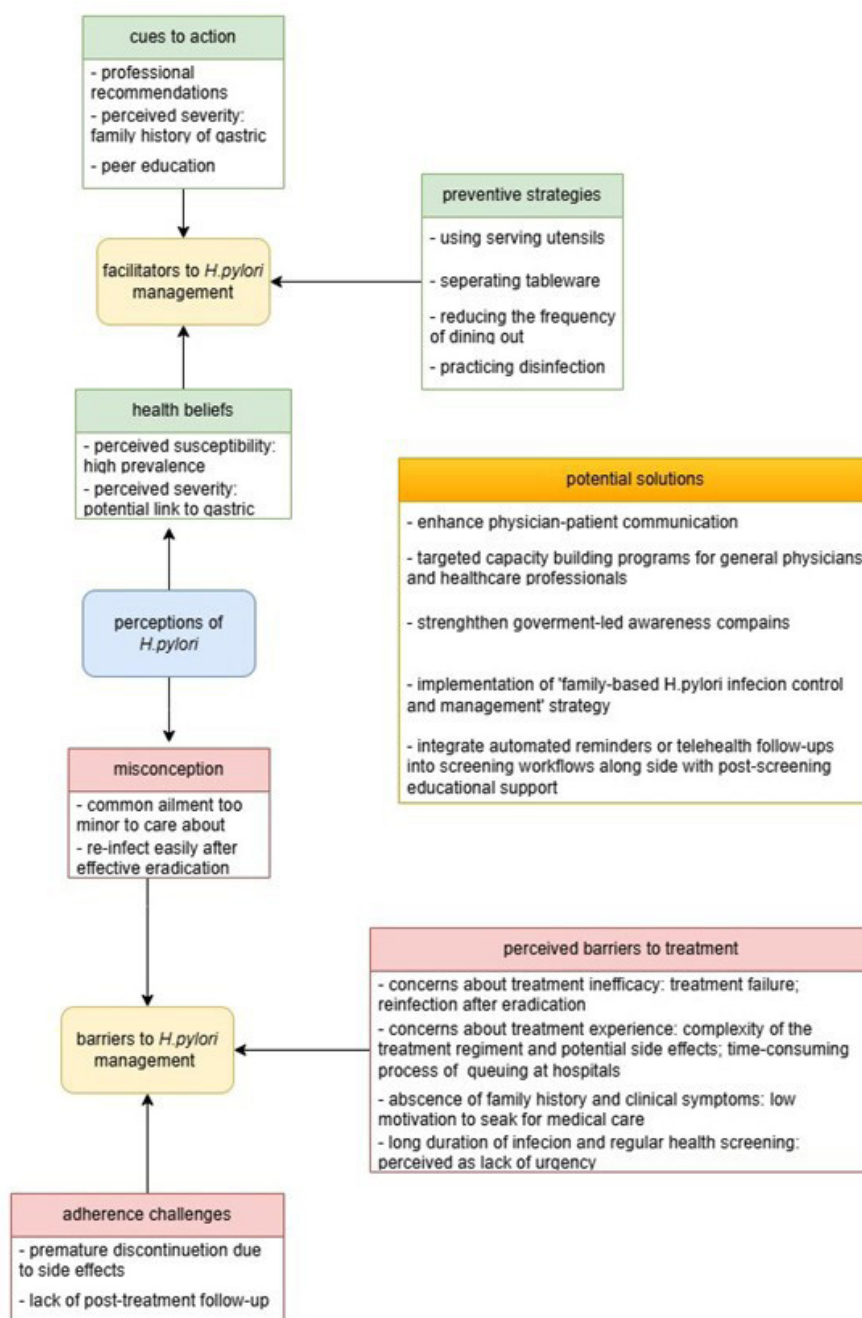


Figure 1 Conceptual model of facilitators and barriers to *H. pylori* management in the population undergoing regular health screening. *H. pylori*, *Helicobacter pylori*.

often busy with work, I haven't had the time to learn more. I do know it's easy to get infected, though. [Participant 9]

I know it's very common in China because most people don't practice table-sharing etiquette. [Participant 20]

Some participants emphasised the transmission risks of *H. pylori*, particularly in the context of communal dining practices, and expressed concerns about the inevitability of reinfection.

I often dine out for social gatherings, and since most people don't use serving chopsticks, it's

easy to get re-infected even after the treatment. [Participant 1]

Regarding treatment, there were diverse levels of understanding, with some having knowledge of treatment necessity, but most of them lacking awareness of treatment details, necessity and benefits. One participant emphasised that nobody told him that Hp infection needed to be treated, even his health screening physician.

I've heard need to eliminate the bacteria completely at the first time. Otherwise, the bacteria might become resistant to the antibiotics and would not be killed after. [Participant 15]

I didn't know Hp infection required treatment. The doctor at the check-up didn't mention anything serious. [Participant 18]

Source of information

Concerning the acquisition of *H. pylori*-related knowledge, the vast majority of participants admitted that they primarily learnt through hearsay. They mentioned consistently the words like "other people said...", "I've heard that...", "some people told me that..." Only three participants stated that they had read the information about *H. pylori* through the internet, but none of them was certain about the reliability of online information.

I've researched online and know there's a strong link between *H. pylori* and gastric cancer but I'm not sure about it. [Participant 7]

Other participants reported that they learnt the information from their family or friends as they got infected by *H. pylori* and had consulted with doctors.

My wife is very health-conscious. She knows more about this (*H. pylori*) than I do. She told me Hp need to be killed once we got infected. [Participant 15]

Theme 2: cues to action

Professional recommendations

Nearly half of the participants (12/23) were willing to accept *H. pylori* treatment even though two of them had discontinued the therapy due to adverse drug reactions. The primary motivators for participants to initiate *H. pylori* eradication therapy were physician recommendations, family history of gastric cancer and concerns about transmitting the infection to family members.

Several participants reported initiating treatment directly based on advice received from their health-care providers, reflecting a high level of trust in medical authority.

I didn't feel anything unusual, but the doctor advised eradication therapy, so I followed their instructions. Doctors are professionals; it's better to listen to them. [Participant 14]

Perceived severity

Family history of gastric cancer also strongly influenced participants' decision-making, especially when close relatives had experienced serious illness.

I've never had any discomfort, but my older sister had gastric cancer. So, whenever I find out I have it, I see a doctor and take the medication immediately. [Participant 7]

My family includes my parents-in-laws, my wife, and my son, and I'm worried about infecting them. [Participant 23]

Peer education

Additionally, some participants described mutual encouragement within their households, particularly among spouses, to undergo diagnosis and treatment together.

My wife and I both discovered Hp infections during our check-ups. She urged me to see a doctor, and we underwent eradication therapy together at last. [Participant 15]

Theme 3: perceived barriers to treatment

Concerns about treatment inefficacy

Many participants perceived *H. pylori* infection as highly prevalent (eg, "60–70 out of 100 people are infected" (Participant 1)), which contributed to a sense of trivialisation. Treatment refusal was commonly rooted in concerns about reinfection, especially in the context of cultural norms such as shared dining practices and the high prevalence of infection within the community.

Even if eradication is successful, I might get re-infected during social gatherings. It's impossible for us business people to avoid them. [Participant 22]

Concerns about treatment experience

Another major factor influencing participants' treatment decisions was concern over potential side effects and the complexity of the treatment regimen, which often involves multiple medications taken over an extended period. One participant explicitly expressed scepticism, stating that taking "a bunch of medication" could still result in treatment failure, implying that such an effort might ultimately be counterproductive.

I heard that eradication requires taking a lot of medicine, including antibiotics, for several days. And the medication can cause discomfort and has many side effects. I don't want to go through that. [Participant 3]

A few participants reported that they were too busy to seek medical care and perceived the time-consuming process of queuing at hospitals for medication procurement as highly inefficient and not worth the effort.

On one hand, I think the infection isn't significant. On the other hand, I don't have time—hospitals are crowded, and getting a prescription takes at least half a day. [Participant 9]

Absence of symptoms and family history

Another common attitude pattern was a perceived lack of urgency. Most participants reported low motivation to seek medical care due to the absence of obvious clinical symptoms. One participant even dismissed the need for treatment, stating that their "stomach discomfort resolved on its own". Additionally, the absence of a family history of gastric cancer led many participants to perceive

themselves as having a lower cancer risk, further contributing to delayed health-seeking behaviour.

My family doesn't have a history of gastric cancer. My parents lived long lives, and I don't have any chronic conditions. I only visit the hospital for check-ups. [Participant 21]

Long duration of infection and regular health screening

Some participants rationalised delaying treatment by citing the long-standing nature of their infection and their reliance on annual health screenings as a substitute for medical therapy. Moreover, several participants believed that undergoing regular health check-ups eliminated the need for follow-up testing for *H. pylori* after treatment.

I've always had this issue (Hp infection), but I have yearly check-ups. If there was a serious problem, the hospital (healthcare centre) would notify me. [Participant 11]

Theme 4: adherence challenge

Premature discontinuation due to side effects

Two participants reported discontinuing therapy due to side effects. One participant specifically noted that she stopped treatment only after consulting her health check-up physician (a general practitioner (GP)). The other participant admitted to self-terminating the treatment on experiencing discomfort, reasoning that she had been asymptomatic prior to starting the medication.

But after two days, I experienced black stools and severe nausea, so I contacted the doctor and he agreed to stop the medicine. [Participant 4]

But after just a few days, I started feeling unwell. I was fine before, and the medication made me uncomfortable, so I stopped taking it. [Participant 14]

Lack of post-treatment follow-up

Only one participant underwent a urea breath test within 3 months after completing treatment, prompted by an endoscopic finding of a gastric ulcer and an explicit recommendation from the attending physician to confirm successful *H. pylori* eradication. Most participants did not complete post-treatment follow-up testing, citing a lack of information from their physicians regarding the necessity of rechecking after eradication therapy.

The doctor didn't tell me I needed a follow-up test after treatment—or at least I don't recall it. [Participant 15]

Some participants forwent the follow-up test, viewing annual health checks as sufficient.

I haven't had a follow-up test, but my annual check-ups include this test, so I'll find out then. [Participant 20]

Theme 5: preventive strategies

Proactive behaviours

Within family settings, participants reported adopting preventive measures such as using serving utensils, separating tableware and practising disinfection, driven by concerns about household transmission of *H. pylori*.

At home, we use separate utensils and disinfect them in a sterilizer. I'm worried about passing it on to the kids. [Participant 12]

Furthermore, some participants reported consciously reducing the frequency of dining out and intentionally using communal utensils during unavoidable social gatherings to minimise the risk of *H. pylori* transmission.

Now, I try to avoid eating out and use serving utensils during social gatherings. [Participant 14]

Dining norms

Social gatherings were identified by most participants as a major source of infection and reinfection risk, with particular difficulty in enforcing separate dining practices or the use of communal utensils, especially during business parties. Additionally, participants noted that most acquaintances did not voluntarily disclose their *H. pylori* infection status and were hesitant to initiate or respond to diagnostic inquiries during gatherings, often leading to uncertainty about the accuracy of any information shared.

When dining out, my friends and I don't talk about this. Meals are more about socializing and business discussions than worrying about such things. [Participant 11]

I'm not sure if they have *H. pylori* infection. But it's not the kind of thing people want others to know about—it might make them fear catching it and avoid you. [Participant 22]

DISCUSSION

In recent years, numerous guidelines on the management of *H. pylori* infection have been published, including recommendations for managing *H. pylori* infection in health check-up populations.^{3 11–14} The Working Group of the International Agency for Research on Cancer of the WHO recommends that population-based *H. pylori* screening programmes use one or more of these three methods for *H. pylori* detection: the 13C-UBT, the stool antigen test and the serology test.¹⁵ The healthcare centre of our hospital adopts the 13C-UBT for screening *H. pylori* among healthy individuals as recommended. Evidence from China has shown that the screen-and-treat strategy for *H. pylori* eradication not only reduces gastric cancer incidence and costs in high-risk populations, but is also efficient in preventing gastric cancer in the general asymptomatic population (individuals who tested positive for *H. pylori* but who were otherwise

healthy).^{2 16 17} However, there remains a paucity of reports on the clinical management and follow-up of largely asymptomatic individuals who test positive during routine health examinations—individuals who, from an epidemiological standpoint, constitute a major reservoir of infection. To our knowledge, this is the first qualitative analysis to explore the perceptions and barriers related to *H. pylori* management among individuals undergoing regular health screenings.

A paradox emerged from our study: while participants acknowledged the contagious nature of *H. pylori*, many trivialised its severity, perceiving it as a “common ailment” rather than a potential precursor to cancer. This finding aligns with global research showing that asymptomatic individuals often underestimate the risks associated with the infection.¹⁸ The reliance on hearsay and information from family or friends underscores a critical gap in professional health education—very few participants cited physicians as their primary source of information. GPs in healthcare centres should take a proactive approach in providing evidence-based education, addressing misconceptions about reinfection and emphasising the connection between *H. pylori* infection and gastric cancer, particularly for individuals with a family history.

Our analysis highlighted the pivotal role of healthcare providers in treatment initiation. More than half of the participants began treatment based on physicians’ recommendations, reflecting a strong trust in professional guidance. This finding supports integrated care models, where screening visits are accompanied by personalised counselling on the benefits of eradication. Additionally, concerns about infecting family members and the influence of peer education served as significant motivators for behaviour change. These insights suggest that a ‘family-based *H. pylori* infection control and management’ strategy could be effective in enhancing treatment adherence.

Another key finding of our study was that some participants declined treatment due to concerns about reinfection during social gatherings, highlighting the challenges posed by table etiquette in China. Business and social dining often precludes utensil separation, creating a pragmatic dilemma for individuals seeking to eradicate *H. pylori* infection. However, in reality, the current annual reinfection rate in China is lower than the global average (1.5% vs 3.1%), according to a large-scale multicentre prospective cohort study.^{19–24} Therefore, strengthening government-led public awareness campaigns—particularly those focused on proper table etiquette for children and adolescents—could more effectively improve the public’s understanding of *H. pylori* infection and reinfection. Additionally, our study found that participants who were asymptomatic, had no family history and had a prolonged infection duration were more likely to decline treatment. Notably, a subset of participants believed that regular health screenings could negate the need for *H. pylori* eradication therapy, further emphasising the critical importance of timely patient-physician communication to correct such misconceptions.²⁵

Adherence challenges, particularly premature discontinuation due to side effects, reflect global trends where treatment complexity (multiple drugs, 14-day regimens) undermines persistence.^{26 27} Clinicians should prioritise pre-treatment counselling on expected side effects and consider offering flexible dosing or alternative regimens for patients with sensitivities. Additionally, one participant emphasised discontinuing treatment after consulting with her health check-up physician, despite her family history of gastric cancer. This suggests discrepancies between clinical practices and current guideline recommendations, particularly among GPs. Given GPs’ central role in primary care, especially in health education and the clinical supervision of screening populations, targeted training programmes on professional knowledge are crucial to enhance their competencies in evidence-based *H. pylori* management protocols. Furthermore, the near absence of post-treatment follow-up (with only one participant rechecking) highlighted a systemic gap. This underscores the need for integrating automated reminders or telehealth follow-ups into screening workflows, alongside professional recommendations, to improve compliance.²⁸

Lastly, this study revealed that a significant majority of participants adopted proactive preventive measures following their *H. pylori* diagnosis, regardless of treatment outcomes. These behavioural adaptations included routine sterilisation of personal tableware, use of separate communal utensils and a reduced frequency of dining out. The findings suggest that incorporating *H. pylori* screening into routine health examinations could effectively enhance public health literacy regarding *H. pylori* infection.

Although the current study is the first investigation to probe into the perceptions and barriers associated with *H. pylori* management among individuals who undergo routine health screenings, there are important limitations to be noted alongside the conclusions. While participants were recruited exclusively from a single healthcare centre that serves geographically diverse populations across China, it should be noted that the cohort predominantly represents individuals from affluent socioeconomic backgrounds. Populations experiencing socioeconomic deprivation and those from rural areas may face different challenges in *H. pylori* management. Second, the enrolled participants were within the 39–62-year-old age range, which means populations younger or older may experience other barriers not addressed in our findings. Therefore, caution is recommended when generalising these results to other populations. Thirdly, although we limited eligibility to individuals who had undergone health screening within 6 months prior to the interview date to minimise recall and participant bias, these potential biases may still persist.

CONCLUSION

Understanding participants’ lived experiences is crucial for overcoming barriers to *H. pylori* management in

health screening populations. Our findings suggest that interventions should focus on addressing informational gaps, social norms and logistical challenges. Clinical encounters should be leveraged to deliver targeted education, provide supportive follow-up and implement culturally adapted strategies. By bridging patient perceptions with evidence-based care, healthcare systems can improve treatment outcomes and reduce the downstream burden of disease. Additionally, targeted capacity-building programmes for general physicians and health management professionals, along with the establishment of structured post-screening communication frameworks, will strengthen therapeutic alliances and serve as pivotal leverage points for advancing evidence-based management of *H. pylori* infections within primary healthcare settings.

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Contributors All authors were involved in the study concept and design. ZW conducted the interviews. ZW and JJ transcribed the interviews, initially analysed the data and discussed the results with CZ. The first draft was written by ZW and was revised by JJ afterwards. All authors commented on previous versions of the manuscript. All authors read and approved the final version of the manuscript. JJ is the guarantor of the study.

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Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Ruijin Hospital Ethics Committee, Shanghai Jiao Tong University School of Medicine, reference number: 2019-75. Participants gave informed consent to participate in the study before taking part.

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ORCID iDs

Zhenzhen Wang <https://orcid.org/0009-0004-5150-4740>

Jie Jiang <https://orcid.org/0000-0002-2565-7645>

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