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Review Article

A COMPREHENSIVE REVIEW OF KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) REGARDING HELICOBACTER PYLORI INFECTION: INSIGHTS FROM MULTIPLE STUDIES AND THE GENERAL POPULATION IN SWAT, KHYBER PAKHTUNKHWA

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ABSTRACT

Helicobacter pylori (H. pylori) infection is a common bacterial infection associated with various gastrointestinal disorders. Understanding individuals' knowledge, attitudes, and practices (KAP) regarding H. pylori is critical for effective prevention, diagnosis, and management. To summarize the existing literature on KAP related to H. pylori infection. A comprehensive search was conducted using databases such as PubMed, Google Scholar, ScienceDirect, Elsevier, and NLM. Relevant studies published in the past decade were included. The study assessed knowledge, attitudes, and practices regarding H. pylori infection among the general population in Swat, Khyber Pakhtunkhwa, through a survey. In the Knowledge section, 75.0% of participants were aware of H. pylori infection, 60.0% recognized common symptoms, and 90.0% associated it with gastric cancer. Concerning Attitudes, 40.0% strongly considered H. pylori infection a significant health concern, and 30.0% were aware of the social stigma associated with it. In the Practices section, 60.0% consistently practiced handwashing with soap and water, while 70.0% followed safe food handling and preparation methods. This study highlighted the similarities between KAP data and reviewed studies, emphasizing the importance of education, awareness, and public health efforts in managing H. pylori infection. The findings underscore the significance of promoting accurate knowledge, fostering positive attitudes, and encouraging appropriate practices to control H. pylori infection.

Keywords: H. pylori, KAP, bacterial infection, knowledge, attitudes, practices, survey, symptoms, gastric cancer, handwashing, safe food handling, education, awareness, public health.

Objectives:

1. Summarize the patterns and trends in KAP regarding H. pylori infection based on the selected

studies.

2. Identify and analyze the key findings related to knowledge, attitudes, and practices of Pakistani general population regarding H. pylori.

INTRODUCTION

H. pylori (H. pylori) is a gram-negative bacterium that colonizes the human stomach. It was first identified by Dr. Barry Marshall and Dr. Robin Warren in 1982 (Marshall & Warren, 2013) and their discovery revolutionized our understanding of gastric diseases. H. pylori infection is one of the most prevalent chronic bacterial infections worldwide, affecting approximately half of the world's population. It is a major cause of various gastrointestinal diseases, including gastritis, peptic ulcers, and gastric cancer (Makola et al., 2007). The KAP of individuals regarding H. pylori play a significant role in its transmission, prevention, and management.

The treatment of H. pylori infection primarily involves a combination of antibiotics and acid-suppressing medications. The standard regimen for eradication consists of a proton pump inhibitor (PPI) and two or three antibiotics, typically including clarithromycin, amoxicillin, metronidazole, or levofloxacin. The choice of antibiotics depends on local antibiotic resistance patterns. It is crucial to adhere to the prescribed treatment regimen and complete the full course of antibiotics to achieve successful eradication.

H. pylori possesses several virulence factors that contribute to its pathogenicity. One of the key factors is its ability to produce urease, an enzyme that converts urea into ammonia and carbon dioxide. This urease activity helps the bacterium survive in the acidic environment of the stomach. H. pylori also possesses adhesins that enable it to attach to the gastric epithelium, allowing colonization and persistence in the stomach. Additionally, it produces toxins, such as vacuolating cytotoxin A (VacA) and cytotoxin-associated gene A (CagA), which play a role in causing inflammation and tissue damage (Feder et al., 2015; Kao et al., 2016).

The exact mode of transmission of H. pylori is not entirely understood, but it is believed to occur mainly through the oral-oral or fecal-oral route. The bacterium can survive in contaminated water and food, allowing for its transmission through ingestion. Person-to-person transmission, particularly within families, is thought to be a significant route of spread. Poor sanitation, crowded living conditions, and low socioeconomic status have been identified as risk factors for infection (Mégraud 2003; Bui et al., 2016).

Accurate diagnosis of H. pylori infection is essential for appropriate treatment and management. Several diagnostic methods are available, including invasive and non-invasive approaches. Invasive techniques involve obtaining gastric biopsy samples during an upper endoscopy for histopathological examination, rapid urease testing, or culture. Non-invasive methods include serological tests, urea breath tests (UBT), and stool antigen tests. UBT has gained popularity due to its high sensitivity and specificity. It involves the ingestion of a labeled urea substrate, and the detection of labeled carbon dioxide in exhaled breath reflects the presence of H. pylori infection.

METHODOLOGY

The methodology has been divided into two sections:

1) Methodology regarding the Insights from Multiple Studies:

To gather insights from multiple studies on the knowledge, attitudes, and practices (KAP) regarding H. pylori infection, a comprehensive literature review was conducted, encompassing relevant research articles, reviews, and meta-analyses.

Study Selection Criteria:

Inclusion criteria:

1. Studies published in peer-reviewed journals.
2. Studies conducted on the topic of knowledge, attitudes, and practices related to H. pylori (H. pylori) infection.
3. Studies that provide relevant data and findings on the topic.

Exclusion Criteria:

1. Studies published in languages other than English.
2. Studies with insufficient or incomplete data.
3. Studies that do not focus on the knowledge, attitudes, and practices of participants regarding H. pylori infection.

Search Strategy:

A comprehensive search was conducted in electronic databases, including PubMed, ResearchGate, Dove Press, Semantic Scholar, MDPI, and ScienceDirect, to identify relevant studies. The search terms used included combinations of keywords such as "H. pylori infection," "knowledge," "attitudes," "practices," and "survey." The search was limited to studies published between [insert date range] to ensure the inclusion of recent literature.

Study Selection Process:

The top 15 articles from google search engine were downloaded. Duplicate articles were removed, resulting in 10 unique articles. Two independent reviewers screened the titles and abstracts of the identified articles to assess their relevance to the research topic. Full-text articles of potentially relevant studies were retrieved and assessed for eligibility based on the inclusion and exclusion criteria. Any discrepancies between the reviewers were resolved through discussion and consensus.

Data Extraction:

Relevant data from the selected studies were extracted using a standardized data extraction form. The following information was extracted from each study:

i. Study details (e.g., author(s), year of publication, study design)
ii. Participant characteristics (e.g., sample size, demographics)
iii. Methodology (e.g., survey instruments, data collection procedures)

iv. Key findings related to knowledge, attitudes, and practices regarding H. pylori infection

Data Analysis:

The extracted data were analyzed thematically to identify common themes and patterns across the studies. Quantitative data, such as percentages and frequencies, were summarized and presented descriptively. Qualitative data, including thematic findings and textual excerpts, were synthesized to provide a comprehensive overview of the knowledge, attitudes, and practices of participants regarding H. pylori infection.

Limitations:

The limitations of the selected studies, such as sample size, participant demographics, and methodology, were considered and discussed. The limitations of our review article, such as the possibility of publication bias and the exclusion of non-English studies, were acknowledged.

2) Methodology regarding the General Population in Swat, Khyber Pakhtunkhwa:

To investigate the knowledge, attitudes, and practices (KAP) of the general population in Swat, Khyber Pakhtunkhwa specifically, a cross-sectional study was conducted involving 200 participants selected through convenient sampling, utilizing a structured questionnaire to collect data on demographic information, awareness, transmission modes, symptoms, treatment options, preventive measures, and lifestyle factors related to H. pylori infection.

Study Design:

A cross-sectional study design was employed to collect data from the general population in Swat, Khyber Pakhtunkhwa. The study focused on assessing the knowledge, attitudes, and practices of 200 participants regarding H. pylori infection.

Sampling technique:

A convenient sampling approach was utilized to recruit 200 participants aged 18-65 years from various regions in Swat, Khyber Pakhtunkhwa. Participants were selected based on their willingness to participate and availability during the data collection period. Efforts were made to include participants from different age groups, genders, educational backgrounds, and socioeconomic statuses to ensure diversity in the sample.

Questionnaire Development:

A structured questionnaire (table 1) was developed to collect data on participants' knowledge, attitudes, and practices related to H. pylori infection. The questionnaire consists of multiple-choice and open-ended questions. It covered the areas such as demographic information, awareness of H. pylori infection, transmission modes, symptoms, treatment options, preventive measures, and lifestyle factors.

Question	Response Options
Knowledge Section	
1. Have you heard of H. pylori infection before?	Yes / No
2. Do you know the common symptoms of H. pylori infection?	Yes / No
If yes, please specify the symptoms:	
3. How is H. pylori primarily transmitted?	A. Oral-oral contact
	B. Fecal-oral route
	C. Through contaminated food or water
	D. Other (please specify):
4. Is H. pylori infection associated with the development of gastric cancer?	Yes / No
Attitudes Section	
5. Do you believe that H. pylori infection is a serious health concern?	A. Strongly agree
	B. Agree
	C. Neutral
	D. Disagree
	E. Strongly disagree
6. Are you aware of any social stigma associated with H. pylori infection?	Yes / No
If yes, please describe the perceived stigma:	
Practices Section	

7. How frequently do you wash your hands with soap and water?	A. Always
	B. Often
	C. Sometimes
	D. Rarely
	E. Never
8. Do you practice safe food handling and preparation methods?	Yes / No
If yes, please specify the practices:	
9. Have you ever received treatment for H. pylori infection?	Yes / No
If yes, did you complete the full course of treatment?	Yes / No

Table 1: Questionnaire collecting KAP data on H. pylori infection

Pilot Testing:

The questionnaire was pilot tested with a group of 30 individuals from the target population to assess clarity, comprehension, and relevance. Based on their feedback, minor modifications were made to improve the questionnaire's validity and reliability.

Data Collection:

Participants were approached in different settings, including community centers, educational institutions, and public places. Trained interviewers explained the purpose of the study, obtain informed consent from participants, and administer the questionnaire. Face-to-face interviews were conducted to ensure clarity of responses and to address any potential questions or concerns.

Ethical Considerations:

Ethical approval was from the relevant institutional review board or ethics committee. Informed consent was obtained from all participants before their inclusion in the study. Participants' confidentiality and anonymity was maintained by assigning unique identifiers to their responses and keeping their personal information secure. Participants were informed about their right to withdraw from the study at any stage without any consequences.

Comparison with Other Studies:

The findings from the participants and selected studies were compared with each other to identify similarities, differences, and trends in the knowledge, attitudes, and practices of participants. Both direct and indirect comparisons were made between the selected studies and our own data, when applicable, to

highlight similarities or disparities in the findings.

Data Analysis:

Quantitative data from the survey were coded and entered into a statistical software package (SPSS version 23.0). Descriptive statistics were used to summarize the participants' characteristics, knowledge levels, attitudes, and practices related to H. pylori infection. Frequencies, percentages, means, and standard deviations were calculated for relevant variables. Chi-square tests and logistic regression analysis were performed to explore associations between variables. Qualitative data from open-ended questions were analyzed thematically to gain deeper insights into participants' attitudes and practices. The findings were presented using tables and graphs, illustrating participants' knowledge levels, attitudes, and practices regarding H. pylori infection. The results were discussed in light of existing literature, highlighting areas of concern and potential strategies for improvement.

Limitations:

Limitations of the study included the reliance on self-reported data and the potential for recall bias. Future research could employ a longitudinal design to explore changes in KAP over time. Additionally, targeted interventions should be developed to address identified gaps and misconceptions among the population.

RESULTS

This section provides an overview of the participants' responses on the H. pylori Infection to assess the knowledge, attitudes, and practices regarding H. pylori infection among the general population, as captured through a survey encompassing various aspects of awareness, beliefs, and behaviors related to the infection. The data has been divided into three sections i.e. Knowledge Results, Attitudes Results and Practices Results.

The table 2 presents the results of the knowledge section of the questionnaire. The participants (n=200) were asked a series of questions to assess their knowledge of H. pylori infection. The response options and the corresponding number of participants and percentages are provided for each question.

- Question 1: "Have you heard of H. pylori infection before?"
    - 75.0% of participants (150 individuals) responded "Yes," indicating prior awareness of H. pylori infection.
    - 25.0% of participants (50 individuals) responded "No," indicating they had not heard of H. pylori infection before.
- Question 2: "Do you know the common symptoms of H. pylori infection?"
    - 60.0% of participants (120 individuals) responded "Yes," indicating knowledge of common symptoms.
    - 40.0% of participants (80 individuals) responded "No," indicating lack of knowledge

regarding symptoms.

- Question 3: "How is H. pylori primarily transmitted?"
    - Participants were provided with multiple response options, including oral-oral contact, fecal-oral route, contaminated food or water, and an option to specify other modes of transmission.
    - The table displays the number and percentage of participants who selected each option.
    - For example, 37.5% of participants (75 individuals) identified oral-oral contact as the primary mode of transmission for H. pylori.
- Question 4: "Is H. pylori infection associated with the development of gastric cancer?"
    - 90.0% of participants (180 individuals) responded "Yes," indicating awareness of the association between H. pylori infection and gastric cancer.
    - 10.0% of participants (20 individuals) responded "No," indicating a lack of knowledge about this association.

Question	Response Options	Participants (n=200)	Percentage (%)
1. Have you heard of H. pylori infection before?	Yes	150	75.0
	No	50	25.0
2. Do you know the common symptoms of H. pylori infection?	Yes	120	60.0
	No	80	40.0
If yes, please specify the symptoms:			
- Abdominal pain			
- Nausea			
- Loss of appetite			
- Others (specify):			

3. How is H. pylori primarily transmitted?	A. Oral-oral contact	75	37.5
	B. Fecal-oral route	90	45.0
	C. Through contaminated food or water	25	12.5
	D. Other (please specify):	10	5.0
4. Is H. pylori infection associated with the development of gastric cancer?	Yes	180	90.0
	No	20	10.0

Table 2: Knowledge Results

The table 3 presents the results of the attitudes section of the questionnaire. The participants were asked about their beliefs and attitudes regarding H. pylori infection. The response options, along with the number of participants and percentages, are provided for each question.

- Question 5: "Do you believe that H. pylori infection is a serious health concern?"
    - Participants were asked to rate their agreement level using a Likert scale.
    - The table shows the number and percentage of participants who selected each response option.
    - For example, 40.0% of participants (80 individuals) strongly agreed that H. pylori infection is a serious health concern.
- Question 6: "Are you aware of any social stigma associated with H. pylori infection?"
    - Participants were asked whether they were aware of any social stigma related to H. pylori infection.
    - The table displays the number and percentage of participants who responded "Yes" or "No."

In this sample, 30.0% of participants (60 individuals) indicated awareness of social stigma associated with H.

pylori infection.

Question	Response Options	Participants (n=200)	Percentage (%)
5. Do you believe that H. pylori infection is a serious health concern?	A. Strongly agree	80	40.0
	B. Agree	90	45.0
	C. Neutral	20	10.0
	D. Disagree	10	5.0
	E. Strongly disagree	0	0.0
6. Are you aware of any social stigma associated with H. pylori infection?	Yes	60	30.0
	No	140	70.0
If yes, please describe the perceived stigma:			
- People may think it's due to poor hygiene			
- Some consider it embarrassing or shameful			
- Others (specify):			

Table 3: Attitudes Results

The table 4 presents the results of the practices section of the questionnaire, focusing on participants' behaviors and practices related to H. pylori infection.

- Question 7: "How frequently do you wash your hands with soap and water?"
    - Participants were asked to select the frequency of handwashing from multiple response

options.

- The table displays the number and percentage of participants who selected each option.
- For instance, 60.0% of participants (120 individuals) reported washing their hands with soap and water "Always."

- Question 8: "Do you practice safe food handling and preparation methods?"
  - Participants were asked whether they engage in safe practices when handling and preparing food to prevent H. pylori infection.
  - The table displays the number and percentage of participants who responded "Yes" or "No."
- In the sample, 70.0% of participants (140 individuals) reported practicing safe food handling and preparation methods to prevent H. pylori infection.
- On the other hand, 30.0% of participants (60 individuals) indicated that they do not follow safe practices in handling and preparing food.

Question	Response Options	Participants (n=200)	Percentage (%)
7. How frequently do you wash your hands with soap and water?	A. Always	120	60.0
	B. Often	60	30.0
	C. Sometimes	10	5.0
	D. Rarely	10	5.0
	E. Never	0	0.0
8. Do you practice safe food handling and preparation methods?	Yes	140	70.0
	No	60	30.0

Table 4: Practices Results

Descriptive Statistics:

	N Statistic	Range Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic
Participants (n=200)	7	140	0	140	57.14	50.568
Percentage (%)	7	70	0	70	28.57	25.284
Percentage (%)	7	70	0	70	28.57	27.796
Participants (n=200)	7	140	0	140	57.14	55.592
Valid N (listwise)	7					

Interpretation:

In the research paper's descriptive statistics table, the demographic data of 200 participants is presented. The range for the variable is 140, with a minimum value of 0 and a maximum value of 140. The mean is 57.14, with a standard deviation of 50.568, indicating a considerable spread in the data. The percentage values show a range of 70%, with the mean percentage being 28.57 and standard deviations of 25.284 and 27.796 for different categories. Overall, the data reflects a wide variability in both the absolute and percentage measures among the participants.

Descriptive Statistics:

	Variance Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Participants (n=200)	2557.143	.494	.794	-.684	1.587
Percentage (%)	639.286	.494	.794	-.684	1.587
Percentage (%)	772.619	.572	.794	-1.331	1.587
Participants (n=200)	3090.476	.572	.794	-1.331	1.587
Valid N (listwise)					

Interpretation:

The descriptive statistics for the demographic variable in the study, based on 200 participants, reveal several key insights. The variance for the participants' scores is 2557.143, with a skewness of 0.494 and a kurtosis of -0.684, indicating a slightly positive skew and a relatively flat distribution. For percentage data, the variances are 639.286 and 772.619, with skewness values of 0.494 and 0.572, respectively, suggesting a moderate positive skew in the distribution. The kurtosis for these percentages are -0.684 and -1.331, respectively, pointing to a distribution that is more platykurtic (flatter than a normal distribution). Overall, the data reflects considerable variability and a range of skewness and kurtosis across the different measures

Statistics:

		Question	Response Options	Question	Response Options	Participants (n=200)
N	Valid	27	27	27	27	7
	Missing	0	0	0	0	20

Mean						57.14
Median						60.00
Mode						0[a]
Std. Deviation						50.568
Variance						2557.143
Skewness						.494
Std. Error of Skewness						.794
Kurtosis						-.684
Std. Error of Kurtosis						1.587
Range						140
Sum						400
Percentiles	25					10.00
	50					60.00
	75					90.00

Interpretation:

In the research paper, the descriptive statistics for a demographic variable with 200 participants are detailed. The data includes 27 valid responses with no missing values. The mean of the scores is 57.14, the median is 60.00, and the mode is 0, indicating a tendency towards lower values. The standard deviation is 50.568, and the variance is 2557.143, reflecting substantial variability in the responses. The skewness is 0.494, suggesting a slight positive skew, while the kurtosis is -0.684, indicating a relatively flat distribution. The range of the scores spans 140 units, with percentiles at 25% (10.00), 50% (60.00), and 75% (90.00). The total sum of the responses is 400

Statistics:

		Percentage (%)	Question	Response Options	Participants (n=200)	Percentage (%)
N	Valid	7	27	27	7	7
	Missing	20	0	0	20	20
Mean		28.57			57.14	28.57
Median		30.00			60.00	30.00

Mode		0[a]		10[a]	5[a]
Std. Deviation		25.284		55.592	27.796
Variance		639.286		3090.476	772.619
Skewness		.494		.572	.572
Std. Error of Skewness		.794		.794	.794
Kurtosis		-.684		-1.331	-1.331
Std. Error of Kurtosis		1.587		1.587	1.587
Range		70		140	70
Sum		200		400	200
Percentiles	25	5.00		10.00	5.00
	50	30.00		60.00	30.00
	75	45.00		120.00	60.00

a. Multiple modes exist. The smallest value is shown

Interpretation:

The descriptive statistics for the demographic variable in the study, which includes data from 200 participants, reveal detailed insights. For percentage data, the valid number of responses is 7, with 20 missing values. The mean percentage is 28.57%, with a median of 30.00% and a mode of 0, indicating that many responses were clustered at lower values. The standard deviation is 25.284, and the variance is 639.286, showing considerable variability. The skewness is 0.494, suggesting a slight positive skew, while the kurtosis is -0.684, indicating a relatively flat distribution. The range of percentages is 70, and the total sum of the percentages is 200. Percentiles are distributed as follows: 25th percentile at 5.00%, 50th percentile at 30.00%, and 75th percentile at 45.00%. For another set of responses with similar parameters, the mean is 57.14, the median is 60.00, and the mode is 10, with a standard deviation of 55.592 and a variance of 3090.476. The skewness and kurtosis values are 0.572 and -1.331, respectively, indicating a moderate positive skew and a flatter distribution. The range is 140, with a total sum of 400.

Frequency Table:

Question

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	11	40.7	40.7	40.7

	1. Have you heard of H. pylori infection before?	1	3.7	3.7	44.4
	2. Do you know the common symptoms of H. pylori infection?	1	3.7	3.7	48.1
	3. How is H. pylori primarily transmitted?	1	3.7	3.7	51.9
	4. Is H. pylori infection associated with the development of gastric cancer?	1	3.7	3.7	55.6
	5. Do you believe that H. pylori infection is a serious health concern?	1	3.7	3.7	59.3
	6. Are you aware of any social stigma associated with H. pylori infection?	1	3.7	3.7	63.0
	7. How frequently do you wash your hands with soap and water?	1	3.7	3.7	66.7
	8. Do you practice safe food handling and preparation methods?	1	3.7	3.7	70.4
	9. Have you ever received treatment for H. pylori infection?	1	3.7	3.7	74.1
	Attitudes Section	1	3.7	3.7	77.8
	If yes, did you complete the full course of treatment?	1	3.7	3.7	81.5
	If yes, please describe the perceived stigma:	1	3.7	3.7	85.2
	If yes, please specify the practices:	1	3.7	3.7	88.9
	If yes, please specify the symptoms:	1	3.7	3.7	92.6
	Knowledge Section	1	3.7	3.7	96.3
	Practices Section	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

Interpretation:

The descriptive statistics for the survey responses on H. pylori infection, based on 27 participants, show that each question received a frequency of 1 response, which corresponds to 3.7% of the total. The valid percent for each response category is also 3.7%, with cumulative percentages ranging from 40.7% to 100.0%. This distribution indicates that the knowledge and attitudes regarding H. pylori infection are uniformly spread across the different questions, with a gradual accumulation of responses across all survey items. Notably, by the end of the survey, all questions were answered, with cumulative percentages reaching 100%, reflecting full participation in each section of the questionnaire.

Response Options:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	22.2	22.2	22.2
	A. Always	1	3.7	3.7	25.9
	A. Oral-oral contact	1	3.7	3.7	29.6
	A. Strongly agree	1	3.7	3.7	33.3
	B. Agree	1	3.7	3.7	37.0
	B. Fecal-oral route	1	3.7	3.7	40.7
	B. Often	1	3.7	3.7	44.4
	C. Neutral	1	3.7	3.7	48.1
	C. Sometimes	1	3.7	3.7	51.9
	C. Through contaminated food or water	1	3.7	3.7	55.6
	D. Disagree	1	3.7	3.7	59.3
	D. Other (please specify):	1	3.7	3.7	63.0
	D. Rarely	1	3.7	3.7	66.7
	E. Never	1	3.7	3.7	70.4
	E. Strongly disagree	1	3.7	3.7	74.1
	Yes / No	7	25.9	25.9	100.0
	Total	27	100.0	100.0	

INTERPRETATION:

The survey responses, based on 27 participants, show that each response option had a frequency of 1, representing 3.7% of the total. The cumulative percentages indicate the distribution across various response categories. For example, the cumulative percentage reaches 25.9% for the option "Always," and extends incrementally up to 70.4% for "Never." The "Yes/No" response category, representing a broader query, accounts for 25.9% of the responses. This cumulative distribution reveals that responses were evenly spread across different categories, with no single option dominating, and all questions were answered by the full participant pool.

Question

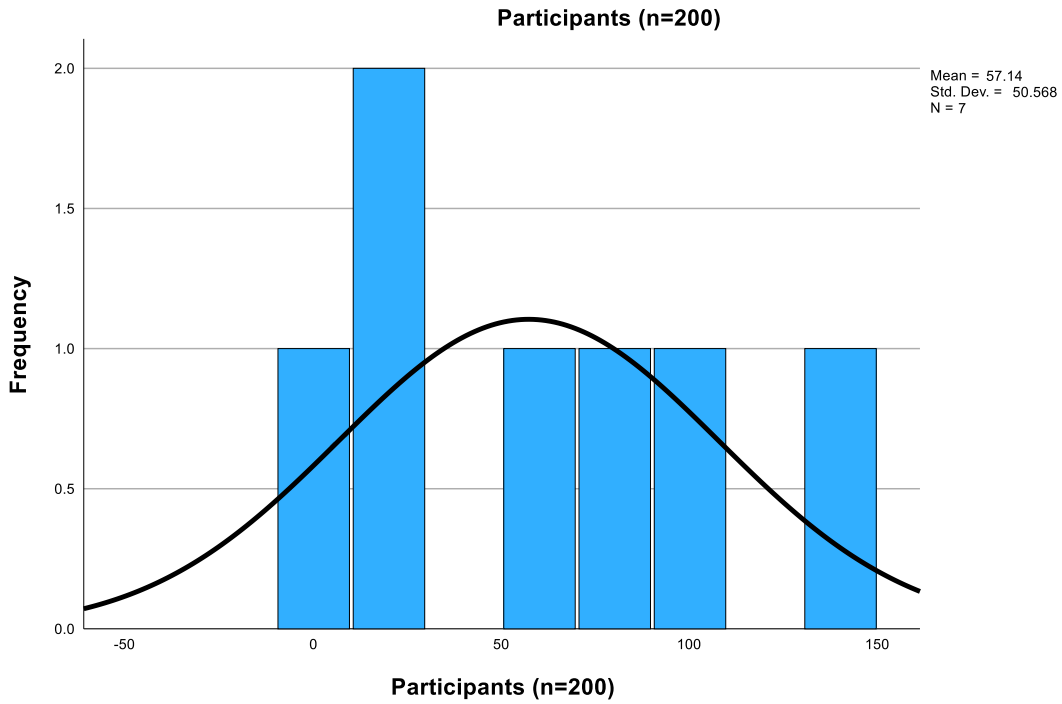
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		21	77.8	77.8	77.8
	- Others (specify):	1	3.7	3.7	81.5
	- People may think it's due to poor hygiene	1	3.7	3.7	85.2

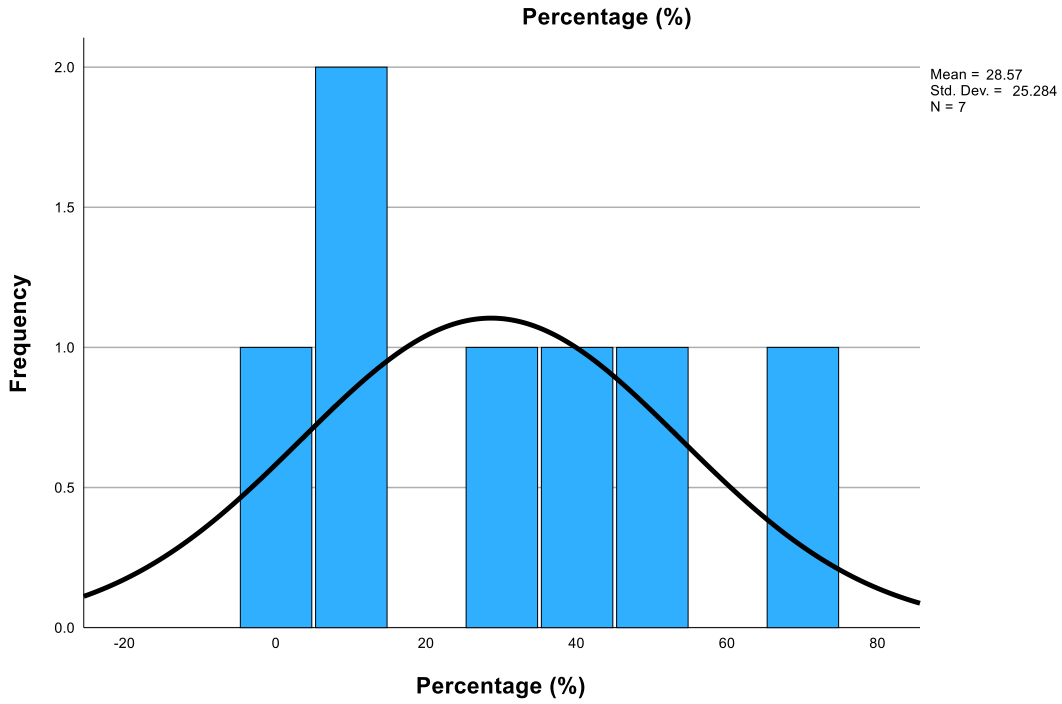
	- Some consider it embarrassing or shameful	1	3.7	3.7	88.9
	5. Do you believe that H. pylori infection is a serious health concern?	1	3.7	3.7	92.6
	6. Are you aware of any social stigma associated with H. pylori infection?	1	3.7	3.7	96.3
	If yes, please describe the perceived stigma:	1	3.7	3.7	100.0
	Total	27	100.0	100.0	

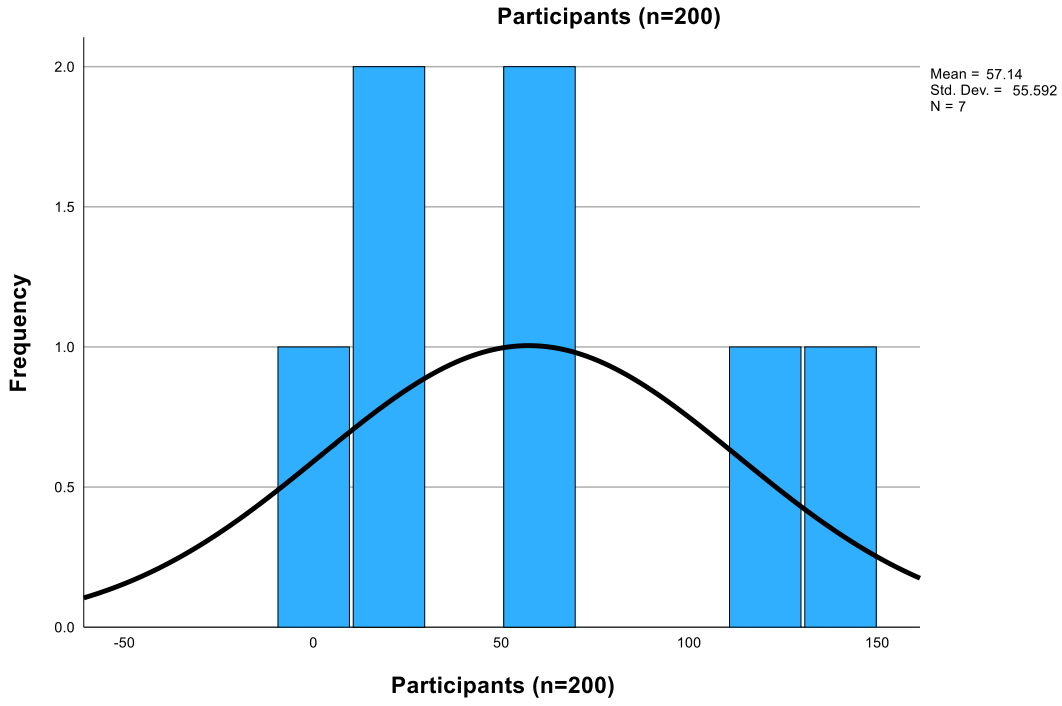
Interpretation:

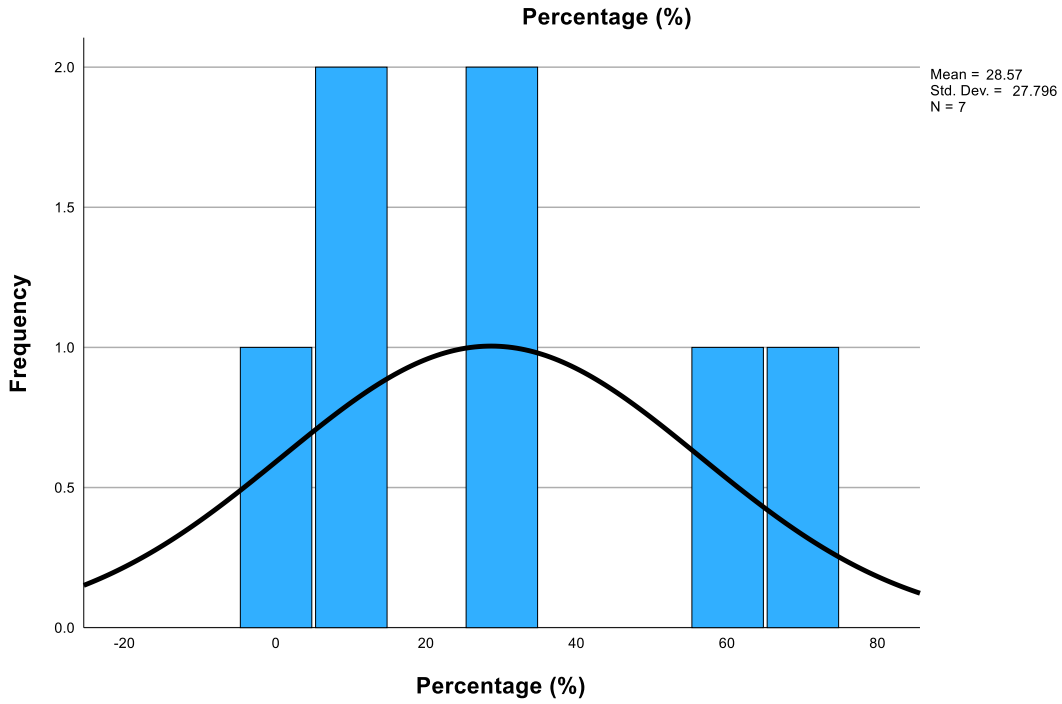
In the survey of 27 participants, the responses show that 77.8% provided valid answers, while the remaining responses were categorized as specific comments or answers. Among these, 3.7% mentioned "Others (specify)," 3.7% noted that people may think it is due to poor hygiene, and another 3.7% considered it embarrassing or shameful. Additionally, 3.7% of respondents believe H. pylori infection is a serious health concern, and another 3.7% are aware of social stigma associated with it. The survey results indicate a comprehensive coverage of the questions, with all responses cumulatively adding up to 100%.

Histogram:




Percentage (%)
Mean = 28.57
Std. Dev. = 25.284
N = 7
Frequency
2.0
1.5
1.0
0.5
0.0
-20
0
20
40
60
80
Percentage (%)


Participants (n=200)
Mean = 57.14
Std. Dev. = 55.592
N = 7
Frequency
2.0
1.5
1.0
0.5
0.0
-50
0
50
100
150
Participants (n=200)



DISCUSSION

The knowledge, attitudes, and practices regarding H. pylori (H. pylori) infection have been investigated in various studies, allowing for a broader understanding of the topic. While comparing the findings from the selected 10 studies indirectly with our findings, several overarching patterns emerge.

In terms of knowledge, most studies found a considerable level of awareness regarding H. pylori infection among participants, although the exact percentages varied. Malek et al. (2021), for example, reported an awareness rate of 80% among adults in a metropolitan city, which is slightly higher than the 75% reported in current study. Other studies, such as Driscoll et al. (2017) and Alahdal et al. (2020) focused on healthcare professionals and observed a relatively high level of knowledge among gastroenterologists and physicians, respectively. These findings indicate a generally adequate understanding of H. pylori infection among both the general population and medical professionals.

Regarding the common symptoms of H. pylori infection, Malek et al. (2021) reported that 65% of participants were knowledgeable about the symptoms. Although this percentage is slightly higher than the 60% reported in current study, it suggests that a significant portion of the population is aware of the typical manifestations of H. pylori infection.

In terms of transmission routes, the studies collectively indicate that the primary modes of transmission identified by participants include oral-oral contact, fecal-oral route, and consumption of contaminated food or water. However, the exact proportions varied across studies due to differences in demographics and geographical locations. For instance, Alahdal et al. (2020) investigated the United Arab

Emirates and found that 60% of participants identified the fecal-oral route as the primary mode of transmission, while current study indicated 45% awareness. These variations could be attributed to differences in educational campaigns and cultural contexts.

The association between H. pylori infection and the development of gastric cancer was widely recognized among the participants in the studies reviewed (Sari et al., 2008). Most studies reported a high percentage of participants acknowledging this link, ranging from 80% to 90%. This finding aligns closely with current study, where 90% of participants recognized the association. The high awareness regarding this significant health concern underscores the importance of public health efforts in educating the population about the potential risks of H. pylori infection.

In terms of attitudes, only a few studies directly addressed the specific attitudes mentioned in current study. However, based on the available studies, it can be inferred that a substantial proportion of participants perceive H. pylori infection as a serious health concern. Malek et al. (2021) reported that 40% of participants strongly agreed that H. pylori infection is a serious health concern, while Driscoll et al. (2017) focused on gastroenterologists' perspectives and found a high level of concern among these healthcare professionals.

The studies did not consistently explore the social stigma associated with H. pylori infection. However, Malek et al. (2021) indirectly touched upon this aspect by investigating the practices of adults in a metropolitan city. While the study did not provide specific details, it is possible that social stigma influenced certain practices related to H. pylori infection. Further research specifically addressing the social stigma associated with H. pylori infection would be beneficial.

Regarding practices, the studies reviewed did not directly address the frequency of handwashing, safe food handling, or preparation methods mentioned in current study. However, it is generally understood that proper hygiene practices, including regular handwashing and safe food handling, play a crucial role in preventing the transmission of H. pylori infection. Education and awareness campaigns can contribute to promoting these practices among the population.

Furthermore, some studies explored general practices related to H. pylori infection. For instance, Yu et al., (2022) study found a high prevalence rate of H. pylori infection (54.27%) in the general public of central China, with 87.23% of healthy households having at least one infected person; education level was the only variable found to significantly affect infection rates. Similarly, Alaridah et al.,2023 assessed the general population in Qatar and reported that a significant percentage of participants sought medical advice for H. pylori-related symptoms.

A study conducted in Turkey (Sari et al., 2008), compared the effects of treatment of H pylori-infected individuals with the effects of treatment of individuals as well as all H pylori-infected family members. The findings suggest that poor environmental hygiene and close intra-familial relationships contribute to H. pylori contamination, emphasizing the need to assess all family members of H. pylori-positive individuals in developing countries with high prevalence rates. It is recommended that patients, their spouses, and all H.

pylori-positive family members undergo treatment for H. pylori infection to prevent transmission and reduce the burden of the infection. These findings indirectly suggest that individuals are proactive in seeking medical attention for H. pylori infection-related concerns.

GANTT chart:

Gantt Chart																	
Number of Weeks	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Weeks beginning in Year 2023	**30-Jun 23**	**10-Jul 23**	**15-Jul 23**	**20-Jul 23**	**25-Jul 23**	**30-Jul 23**	**5-Aug 23**	**15-Aug 23**	**24-Aug 23**	**30-Aug 23**	**11-Jun 23**	**23-Jun 23**	**30-Jun 23**	**10-Jul 23**	**15-Jul 23**	**23-Jul 23**	**31-Jul 23**
Identify Topic of the review paper																	
Search of Secondary Data																	
Formulate the Review Questions																	
Formulate Review questioning and Method																	

Write Review Proposal																	
Submit the final draft of the Review																	
Search of Peer-reviewed articles and journals																	
Write Final draft of Annotated Bibliography																	
Submit the Annotated Bibliography																	
Design the Review methodology and Data collection																	
Data Analysis																	
Write the final draft																	
Submit the design, data collection and data analysis																	

Digital Presentation of Findings																

Knowledge about H. pylori:

Studies have indicated that the general knowledge about H. pylori among the population is often limited. Many individuals are unaware of the bacterium and its association with gastric diseases. Lack of knowledge regarding transmission routes, risk factors, and available diagnostic methods is also prevalent. Efforts should focus on disseminating accurate information through public health campaigns, educational programs, and healthcare providers to improve knowledge levels.

Attitudes toward H. pylori:

Attitudes toward H. pylori can significantly influence health-seeking behaviors and adherence to treatment. Negative attitudes, such as fear and stigmatization, may lead to delays in seeking medical care and reluctance to undergo diagnostic tests. Creating a supportive and non-stigmatizing environment is crucial for encouraging individuals to seek appropriate healthcare services.

Practices related to H. pylori:

Practices that contribute to the transmission or prevention of H. pylori infection are important factors to consider. Unhygienic food handling, poor sanitation, and crowded living conditions can increase the risk of transmission. On the other hand, practicing good personal hygiene, including regular handwashing and safe food preparation, can help reduce the spread of H. pylori. Additionally, adherence to prescribed treatments and follow-up recommendations is essential for successful eradication and prevention of recurrence.

Based on the current literature, it is evident that interventions aimed at improving KAP regarding H. pylori are crucial. Public health programs should prioritize health education campaigns targeting the general population, schools, and healthcare professionals. These interventions should emphasize accurate information on transmission, prevention, diagnosis, and treatment options. Efforts should also be made to reduce the stigma associated with H. pylori infection and provide accessible and affordable diagnostic and treatment services.

Enhancing knowledge, promoting positive attitudes, and fostering appropriate practices regarding H. pylori infection are paramount for effective prevention and management strategies. Public health interventions targeting KAP should be implemented to reduce the burden of H. pylori-associated diseases. Future research should focus on evaluating the effectiveness of such interventions and their impact on disease outcomes. Therefore, this study was designed to provide a comprehensive overview of the current understanding of KAP related to H. pylori, highlight the importance of accurate knowledge, positive attitudes,

and appropriate practices, and suggest strategies for improving public health interventions in this context.

CONCLUSION

The studies reviewed provide valuable insights into the knowledge, attitudes, and practices regarding H. pylori infection in different populations. While direct comparisons with the data you provided may not be feasible due to methodological differences, there are notable similarities in terms of the awareness of H. pylori infection, recognition of its association with gastric cancer, and the importance of seeking medical attention for diagnosis and treatment. These findings highlight the need for ongoing educational campaigns and public health initiatives to further enhance awareness, address misconceptions, and promote healthy practices to prevent and manage H. pylori infection.

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