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Stomach Cancer: Understanding Public Attention to Risk Factors, Warning Signs and Screening Approaches, a Cross-Sectional Survey Study

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Abstract

Stomach cancer (SC) maintains constituting a major cause of cancer-linked mortality globally and its prevalence elevates sharply, screening of the risk factors is important. The study objected to estimate the knowledge of risk factors especially *H. pylori* and warning symptoms and behavior towards SC screening tools among the general population in an Egyptian governorate.

A cross-sectional survey was carried on 876 participants, 512 females and 364 males in Giza city along the period from September 2024 to December 2024 in form of self-designed questionnaire. The questions involve personal and demographic information, the individual's general knowledge about SC potential risk factors, and associated signs. Another group stressed on how likely the participants undergo screening for SC and how important the idea of screening is? Ultimately, determine which sources of health information are the most motivated? The demographic criteria of 876 over 18 years of age responsive participants revealed 58.45% females and 41.55% males, 62.1% in mid-aged, 65.52% not reach college degree and 52% were working. The most recognized risk factors were *H. pylori* infection, smoking and eating a lot of salty, smoked, or pickled foods, obesity were big concerns (64.27%), (62.39%), and (52.05%) respectively. The majority of participants (94.06%) haven't undergone screening despite of 85.16% of the participants believe that screening tests are important for early diagnosis. The main mentioned reason is the cost (62.74%) followed by fear (16.21%). The most mentioned sign linked to SC was stomach pain (75.68%), followed by unexplained weight loss (52.05%). As expected, the main information source was social media and internet (56%) while, healthcare providers constitute only (3.7%). There is an extreme need to elevate the public's awareness about the importance of early screening methods for stomach cancer and enhance trustable information sources as health providers advising.

Keywords: Stomach cancer- risk factors- symptoms- screening-cross-sectional study.

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Introduction

Statement of the Problem

Stomach cancer (SC), also termed as gastric cancer, continues to institute a significant global health concern, and usually ranking among the most common and lethal cancers (Bray *et al*., 2024). Globally, it was recognized as the fifth most prevalent malignancy and the fifth

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leading reason of cancer-associated deaths in last 5 years. Over the past decades, increasing in the absolute number of new cases was continues to occur in spite of decreasing in global age-standardized incidence and death rates (Li *et al*., 2022). The concentrated burden observed in regions underscore the persistent impact of region-specific risk factors such as high-sodium diets and *Helicobacter pylori* (*H. pylori*) infection as in Egypt (Salem *et al*., 2019). This highlights an enforcement need for targeted public health interferences that are susceptible to varied regional dietary and lifestyle manners, rather than depending on a generalized approach (Thrift and El-Serag, 2020).

In the United States, SC remains a grave challenge, with estimated approximately 30,300 new recognition and 10,780 deaths rates in 2025. The prognosis for SC patients in the U.S. is particularly frustrated, only 36% are related to 5-year survival but decreased to 7% when the cancer is diagnosed at a late stage (Bray et al., 2024). Nevertheless, the prevalence of SC in Egypt has a variant scenario as it is the 12th most noticed cancer in both sexes representing 1.6% of the total malignancies and 2.2% cancer death cases and 55% of cases occur between 50 and 70 years of age (Darwish *et al*., 2016, Ramez *et al*., 2021). This wide survival variance strictly asserts the imperative for efficient prohibition strategies and early recognition.

Extracting from epidemiological view, a remarkable proportion of SC cases is attributed to modifiable risk factors, which their abstractions a cornerstone of illness control (Lu *et al*., 2021). The principle key modifiable factors involve alcohol consumption, *H. pylori* infection, particular dietary patterns as 'high-sodium diets and tobacco use which is known to double the risk of stomach cancer (Boi-Dsane *et al*., 2023).

In spite of, scientific research asserts that SC is largely preventable via lifestyle alterations and regular screening, which could reduce about 60% to 70% of cases, the illness consistent to institute a prime public health concern. So, this ongoing issue indicates to a gap between what people know about prohibiting the disease and actual health actions. If people believe that cancer is a disease could be preventable but in the same time, they do not act on this belief, it proposes that the message is not being translated into practice (Shah *et al*., 2020).

The Importance of the Study

Scientific Importance

This present study is scientifically substantial as, It will provide a current, comprehensive assessment of public understanding regarding stomach cancer's dietary risk factors, screening tools and prevention. The findings will provide empirical data to pinpoint particular knowledge gaps, such as *H. pylori* detection, misunderstandings about diet or, identifying barriers like fear of gastroscopy. This study potentiates significant scientific importance as it will share a present and systematic assessment to the academic literature on public comprehending of stomach cancer.

Applied Importance

The results of the current study will have a significant impact on public health by supplying the evidence required to emerge highly targeted educational programs. By

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improving public comprehending, the study can encourage more people to join preventive behaviors, as *H. pylori* testing, healthier diets, and smoking cessation. Study can also encourage earlier diagnosis by elevating symptom awareness, an earlier detection is directly associated to better survival rates. The data may also highlight the requirement for more education among healthcare providers.

Objectives of the Study

Primary Objectives

Quantitative assessment of the ongoing level of public understanding concerning dietary risk factors for stomach cancer, high-salt foods, processed meats, low fruits and vegetables intake, and their linked mechanisms of action in gastric carcinogenesis. Evaluation of public awareness of rotted stomach cancer barring strategies. This encompasses understanding the importance of *Helicobacter pylori* abstraction, catching specific dietary modifications, the impact of alcohol and tobacco cessation, and the significance of keeping a healthy body weight.

Secondary Objectives

Identifying other factors, such as age, gender, educational achievement, and income, as well as socioeconomic factors. Determination of the realized barriers that obstruct individuals from taking on the preventive behaviors or looking for early detection of SC. Identifying the main sources from which the public gets their health knowledge about stomach cancer.

Study Questions

To achieve the stated objectives, the following specific study questions will guide the research:

What is the ongoing level of public comprehension of dietary risk factors? and how precise is this comprehension paralleled to scientific proof?

How aware are the people about asserted SC prohibition approaches? including the importance of *Helicobacter pylori* eradication, specific dietary guidelines, tobacco and alcohol control, and maintaining a healthy body weight?

What are the main barriers that impact individuals' wish to embrace stomach cancer preventive approaches or to request early medical concern for potential signs or screening?

What are the most prevalent sources of public about health information and how do these sources affect their understanding of stomach cancer?

Dietary Risk Factors for Stomach Cancer

Dietary factors play a crucial role in the etiology of SC, with extensive epidemiological proof associating particular consumption patterns to illness risk. Understanding these links is pivotal for efficient public health prevention strategies (Richa *et al*., 2022).

High Salt Intake and Salt-Preserved Foods

The increased risk of stomach cancer is strongly linked with consumption of high-salt foods and those preserved with salt because of direct damage to the gastric mucosal cells. High salt concentrations can disrupt the guard mucosal barrier, resulting in inflammation, altered mucin production, and cellular damage. This involved environment elevates the

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susceptibility of the gastric lining to carcinogens and eases the colonization and activity of a known gastric carcinogen, *H. pylori* (Balendra *et al*., 2023).

Research has displayed a significant rise in SC risk with higher sodium consumption, especially from processed foods, meta-analyses have pointed a statistically remarkable 15% and 24% elevated risk for high salt intake and consumption of salted fish respectively (Yoo *et al*., 2020).

Processed Meats

Consumption of variant processed meats, is consistently associated with an increased risk of SC, particularly non-cardia gastric cancer, while for red meat as a direct etiology is not evident. Nitrates and nitrites can react within the acidic environment of the stomach to form N-Nitroso compounds (NOCs) which are potent carcinogens (Kim *et al*., 2019). Additionally, high-temperature cooking approaches, frying, baking, grilling, or barbecuing meats can produce other carcinogenic compounds, notably polycyclic aromatic hydrocarbons (PAHs) and heterocyclic amines (HCAs) (Mark *et al*., 2005).

Protective Role of Fruits and Vegetables

Conversely, the lower risk of SC is usually linked to a diet rich in a variety of colorful fruits and vegetables, beans, whole grains, poultry and fish because of the abundance of bioactive components within these foods. The research suggests a synergistic impact where a healthy diet not only directly minimizes cancer risk via its antioxidant and anti-inflammatory characteristics but also provides a healthier gastric environment not suitable to *H. pylori*-induced carcinogenesis (Łuszczki *et al*., 2023).

Other Dietary Factors

Notably, there are other dietary elements implemented in SC risk, excessive or even moderate alcohol consumption, greater body fatness and also the consumption of charred foods (Urciuoli, 2016).

Prevention of Stomach Cancer

***Helicobacter pylori* Eradication**

H. pylori is evidently classified as a Class 1 human carcinogen, and its removal is greatly recommended as an effective and cost-efficient policy for minimizing gastric cancer risk, especially in asymptomatic individuals (Sokic-Milutinovic *et al*., 2015). Regarding the pathogenesis of *H. pylori*, the pathogen induces chronic inflammation and damage of the acid-secreting glands in the stomach, which leads to pre-neoplastic lesions as atrophic gastritis and intestinal metaplasia. The pathogen also outputs vacuolating cytotoxin A and cytotoxin-associated gene A, which have direct oncogenic impacts (Kusters *et al*., 2006). Although eliminating *H. pylori* is effective, stomach cancer can still develop, particularly if a person already has intestinal metaplasia (IM). This indicates that there may be an irreversible point in cancer development (Khozani *et al*., 2024). Therefore, public health campaigns should not only stress early detection and eradication of *H. pylori* but also emphasize the need for continued monitoring for high-risk individuals.

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Lifestyle Modifications

Several lifestyle modifications are substantial for SC prevention. Dietary alterations are essential, rich in fruits, vegetables, and fiber, besides limiting salted, smoked, and poorly preserved foods intake, as well as processed and red meats. Tobacco and alcohol control are also crucial preventive measures with maintaining a healthy body weight and joining regular physical activity (Ko *et al*., 2023).

Early Detection and Screening

Early recognition is a cornerstone of promoting SC survival rates and believed to prohibit a high percentage of cases, actually, there is no current widely implemented standard screening technique for SC. Recently, non-invasive techniques, as oral microbiome analysis, are considered promising approach for early detection (Xia *et al*., 2022).

The disconnection between what people know about cancer prohibition and what they actually do is a prime issue. Numerous people don't get screened because they don't have symptoms, which expose a substantial misunderstanding of early detection. To overcome this, prevention efforts must address both lifestyle alterations and the psychological hurdles to screening (Izzeddin *et al*., 2025).

Methods

A cross-sectional study was carried on 876 participants, 512 females and 364 males randomly selected those deal with public hospitals' out-patient and clinics related to digestive and gastrointestinal complains in Giza city. The study was conducted from September 2024 to December 2024.

A self-designed questionnaire was asked to the public, provided in Arabic, and then translated to English for study writing. The survey was developed on the basis of evaluating the awareness of the general public concerning the subject of SC.

The survey began with acquiring personal and demographic information of each applicant concerning their age, sex, level of education and occupation. Other questions have targeted the individual's general knowledge about the disease, potential risk factors, and related symptoms. Another set focused on how likely the applicants undergo screening for SC and how important the idea of screening is? Finally, assess which sources of health information are the most influential?

Results

Demographics data

A total of 876 responsive participants, 512 females (58.45%) and 364 males (41.55%) answered the questionnaire, only participants over 18 years of age were eligible. The demographic breakdown displayed that 62.1% of participants were aged between 30 and 50 years. Concerning education, nearly two third of the participants (65.5%) not reach college degree. Working participants have constituted 52% and most were males while 33.2% were non worker mostly females table (1).

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Table 1: Demographic features of participants

Feature	Number	
	Male	Female
	364 (41.55%)	512 (58.45%)
Age		
18-29	42	68
30-39	132	182
40-49	96	134
50-59	54	72
≥60	40	56
Education		
Non- educated	37	92
Main Education	69	168
Secondary school	73	135
University	136	83
Higher level	49	34
Occupation		
Student	18	33
Employed	264	191
Unemployed	44	247
Retired	38	41

General knowledge about cancer

Regarding the general knowledge and prevalence of cancer, 60.3% of participants have a personal or family cancer history. Interestingly, most prevalent cancers are breast in females while lung and prostate cancer in males. On the other side, a very little percentage of participants (8.1%) hear or have knowledge about stomach cancer specifically, most of them have university education or more, table (2).

Table 2: Knowledge about cancer general prevalence or stomach cancer.

Question	Number			
	Male	Female	Total	%
Do you have a personal or family history of any cancer?				
Yes	223	305	**528**	**60.3**
No	35	72	**107**	**12.2**
I don't know	106	135	**241**	**27.5**
Do you hear or have knowledge about stomach cancer?				
Yes	48	23	**71**	**8.1**
No	316	489	**805**	**91.9**

Knowledge of Risk Factors and Prevention

The survey revealed that 32 out of 876 participants (3.6%) have suffered from a stomach cancer condition all have a history of *H. pylori*. Notably, the pathogen constitutes high prevalence rate among participants (61.87%) so it acts as the first and most substantial risk factor for SC. Regarding other risk factors, the participants have proposed that smoking and

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eating a lot of salty, smoked, or pickled foods were big concerns (64.27%) and (62.39%) respectively, followed by obesity (52.05%). The least ones were diet lack of fruits and vegetables (21.57%) and then alcohol drinking (4.91%). Notably, the low percentage of alcohol consumption answer may due to the absence of information as 72.37% of participants said 'I Don't know', table 3.

Table 3: Awareness about risk factors of stomach cancer.

Question			
How much do you think each of the following contributes to the risk of getting stomach cancer?	Not at all	Possible	I Don't know
Eating a lot of salty, smoked, or pickled foods	53	546	277
Eating very few fruits and vegetables	476	189	211
Smoking cigarettes	75	563	238
Alcohol drink	170	43	634
Being overweight or obese	245	456	175
Are you suffered from signs or diagnosed stomach cancer?			
yes	32		
No	325		
I don't know	519		
Are you diagnosed H. pylori?			
yes	542		
No	103		
I don't know	231		

Awareness of symptoms related to stomach cancer.

This part of the survey engaged knowledge of signs potential to stomach cancer condition. The most known sign was stomach pain (75.68%), followed by unexplained weight loss (52.05%), and heartburn or indigestion (50.9%). Thirty seven percent of participants have proposed that all signs asked about are implemented and related to stomach cancer figure 1.

Awareness about Screening and early detection

Extracting from table (4), 85.16% of the participants believe that screening tests can recognize stomach cancer before signs appear, but on the contrary side, 94.06% never had a medical procedure to screen for stomach cancer. Majority of this side think that the screening methods are so expensive (62.74%), followed by fear of the concept (16.21%). Notably, 15.3% of the cohort said that the screening methods were not recommended by their doctors' figure (2).

Table 4: Knowledge about screening methods and early detection

Question	**Yes**	**No**
Do you believe that screening tests can find stomach cancer before symptoms appear?	746	47
Have you ever had a medical procedure to screen for stomach cancer, such as a gastroscopy?	52	824

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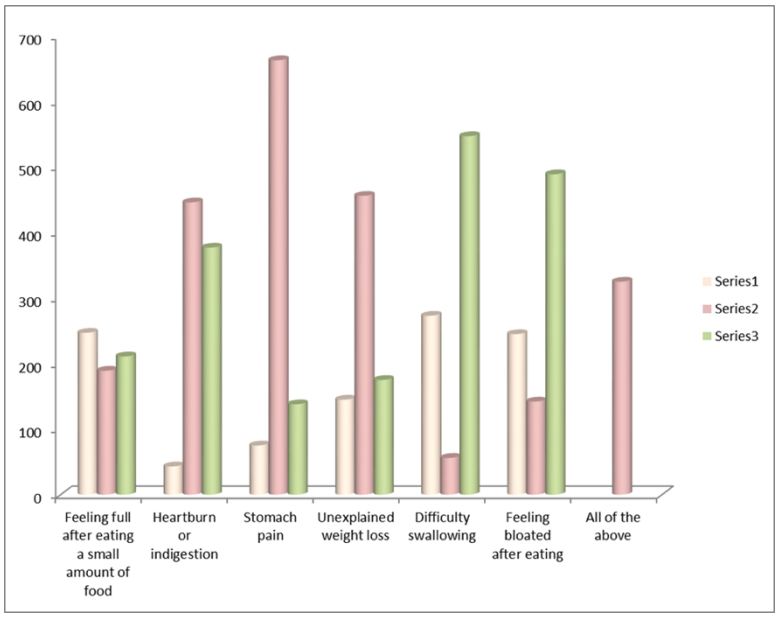

Figure 1: Knowledge of common symptoms related to stomach cancer.
(Series1: Not at all Series 2: Possible Series 3: I Don't know).

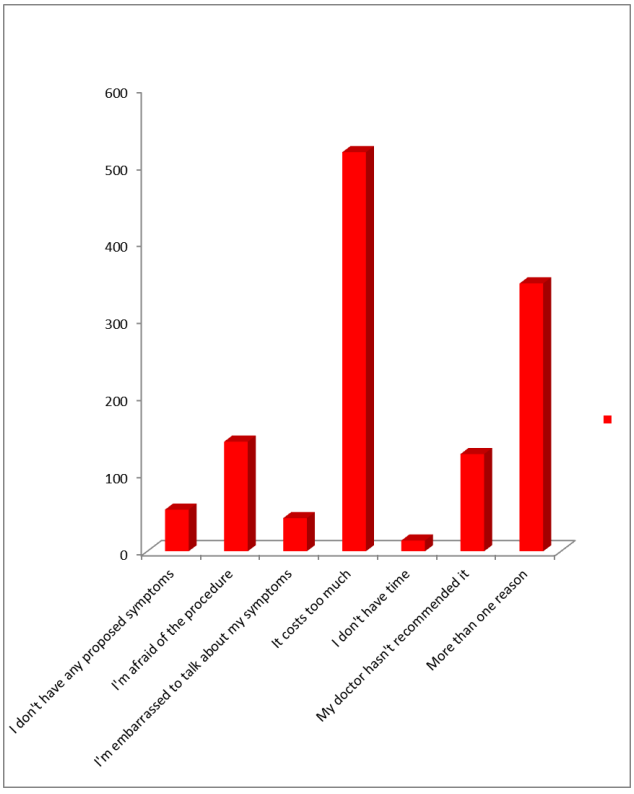

Figure 2: The reasons which prevent participants to perform screening methods

Sources of Information

According to figure (3), 56% of participants had mainly captured their information about cancer from social media and internet (the most are females), persuaded by television and

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radio media (24.4%), while, it was stubbed that the healthcare providers constitute only (3.7%).

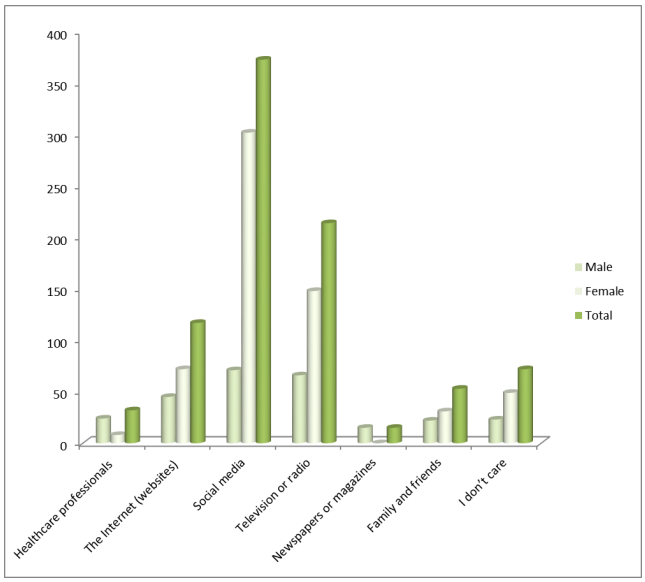

Figure 3: source of information about stomach cancer.

Discussion

Public awareness surveys display a remarkable lack of knowledge about cancer risk factors and signs. For stomach cancer, numerous people miscomprehend risk, this misperception misdirects prevention efforts.

Prime barriers to early diagnosis also subsist (Wang *et al*. 2024).

In current study, 60.3% of participants have a personal or family cancer history with the most prevalent cancers are breast in females while lung and prostate cancer in males. This finding was harmonized with that reported about the common cancer types diagnosed in Egyptian people of both genders (Globocan, 2020). Particularly, the little incidence of stomach cancer mentioned in study was consistent with the Arab world cancer reports (Ibrahim and Shash, 2022).

The study displayed that all participants suffered from stomach cancer condition, have complained or diagnosed *H. pylori*. Moreover, the finding pointed to high prevalence rate of the pathogen among participants (61.87%).

This incidence rate is coincided with global reports which demonstrated the common infection with *H. pylori*, particularly in low- and middle-income countries as pathogen. Also, Duan *et al*., (2025) stated that *H. pylori* influencing an estimated more than 50% of the world's population (Grad *et al*. 2012).

This data asserts the major role of *H. pylori* as the prime risk and causative factor in SC pathogenesis. This is consistent with several studies,

Epidemiologic reports have displayed that people who have chronic *H. pylori* infections have an elevated risk of developing non-cardia gastric adenocarcinoma (Morais *et al*. 2022 and Yao *et al*. 2023), as well as gastric cardia cancer (Han *et al*. 2023 and Yang *et al*. 2021).

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Additionally, studies have revealed that therapeutic eradication of *H. pylori* infection minimizes the risk of SC in asymptomatic individuals (Li *et al*. 2019), in individuals at rosed risk due to family history (Choi *et al*. 2020), and in those who have had surgery for early SC (Lee *et al*. 2016).

It is believed that nearly all patients with gastric MALT lymphoma expose signs of *H. pylori* infection, and the risk of emerging this cancer is fundamentally greater in affected people than unaffected ones (Parsonnet *et al*. 1994 and de Sanjose *et al*. 2004). The strongest proof binding *H. pylori* infection with gastric MALT lymphoma extracted from studies displaying that when patients with this lymphoma are treated with antibiotics to eradicate *H. pylori*, their tumors shrink (Fischbach *et al*. 2004 and Stathis *et al*. 2009).

The data extracted from current study demonstrated other risk factors associated to SC affection, smoking then eating a lot of salty, smoked, or pickled foods, obesity, lack of fruits and vegetables in diet and alcohol drinking were concerns as 64.27%, 62.39%, 52.05%, 21.57% and 4.91%. These notable findings were corresponded with other previous studies, a number of experimental investigations found that salt had a co- carcinogenic influence when integrated with *H. pylori* infection. A detailed meta-analysis of longitudinal researches exhibited that salt-rich foods have a strong induced effect on the incidence of SC in the general population (D'Elia *et al*. 2014).

Also, pickled foods' consumption which is common dietary practice in Egypt

And also, in other regions in world has been associated with an elevated incidence of SC in meta-analysis observational investigations. The findings implicate that consumption of pickled vegetables/foods may rise the risk of SC by 50% (Ren *et al*. 2012). Smoked food is a well-known source of carcinogenic PAH compounds. Following to epidemiological studies, people who regularly ate smoked-dried salted meats which contain carcinogenic heterocyclic amines had a nearly three-fold increased risk of stomach cancer (Phukan *et al*. 2006).

A meta-analysis performed by Ma et al. (2017) included ten studies revealed that consuming alcohol increases the risk of SC. This may be attributed to the fact that alcohol can act as a solvent, facilitating other toxic compounds to affect upper digestive tract cell lining. This meta-analysis asserted that alcohol intake can raise the risk of SC even at moderate levels.

Also, smoking is considered a notable risk factor implemented in various forms of cancers, not only cancers affecting the gastrointestinal tract (Jacob *et al*. 2018).

With the elevating prevalence of obesity worldwide, findings of a study performed by Ruixin *et al*., (2025) revealed that obesity significantly elevates risk of SC and remarkably affects the treatment of patients. In the same manner, analysis of Korean wide population-based cohort exposed SC risk was the highest in persistent obesity group, persuaded by non-persistent obesity group compared with never-obesity set (Lim *et al*., 2022).

On the other side, alteration in dietary behavior as high fruits and vegetables intake has found to be linked to a lower risk of cancers in over 200 epidemiological case-control and cohort studies. The consumption of fresh vegetables and fruits, which contain antioxidant vitamins, vitamins A and C, caused significant reduction of gastric cancer risk (Bae and Kim, 2016). A study was conducted on 14 case–control studies (5362 cases, 11,497 controls), the

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findings demonstrated that high dietary vitamin C from adjusted fruit and vegetables intake had reduced SC (Sassano *et al*., 2024).

The findings of present study displayed that participants have suggested stomach pain (75.68%), unexplained weight loss (52.05%), and heartburn or indigestion (50.9%) known as most symptoms proposed to SC. These data were harmonized with other studies, an Omani study investigated the recognition of symptoms of SC as "unexplained weight loss" (48.0%), "frequent bloating and flatulence" (36.8%) and "abdominal pain" (33.8%), (Al-Azri *et al*. 2019). Also, Huang *et al*., (2019) mentioned that unexplained weight loss (69.5%), upper abdominal pain (69.6%) and epigastric distention (66.2%) were the most proposed symptoms of gastric cancer.

Extracting from table (4), in spite of, 85.16% of the participants believe that screening tests can detect stomach cancer prior to appearance of symptoms, 94.06% of them never had a medical procedure to screen for stomach cancer. Majority of this side think that the screening methods are so expensive (62.74%), followed by fear of the concept (16.21%). Notably, 15.3% of the cohort said that the screening methods were not recommended by their doctors.

Huang *et al*., (2019) stated that 80.0% of study participants reported "certainly yes/probably yes" for the importance of screening methods, parallel to the study performed by Wang *et al*., (2024) who reported that a significant part of participants (78.5%) had not joined in GC screening.

The study results which presented in figure (3), showed that 56% of participants had primarily gained their information about cancer from social media and internet (the most are females), followed by television and radio media (24.4%), while, unfortunately the healthcare providers constitute only (3.7%). Wang *et al*., (2024) demonstrated that videos on social media platforms can aid the public knowledge about symptoms, etiologies, causations and treatment methods of SC. However, both videos' content and quality are inadequate.

Conclusion and recommendation

General public knowledge about stomach cancer is poor, several challenges and barriers were existed, low education, low income, extraction the information from non-trustable sources as social media. The link between *H. pylori* infection and GC is highly evident. Early understanding of SC related symptoms and necessity of performing the screening methods for detection of *H. pylori* and early diagnosis of stomach cancer to elevate the rate of curing and survival. Encourage of doctor and other health providers to give proper consultant for population.

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