Original Article :

Knowledge of Gastric Cancer Risk Factors, Warning Symptoms, and Screening Among the General Population in Makkah, Saudi Arabia

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Abstract

Background & Aims:

Gastric Cancer (GC) is considered the fifth most prevalent cancer worldwide. The awareness of GC symptoms may lead to early diagnosis. Thus, this study aimed to assess the level of knowledge regarding risk factors, warning symptoms, and the screening attitude of GC.

Methods:

Data for this descriptive cross-sectional study were collected from the general population in Makkah via an electronic self-administered questionnaire. The collected data were analyzed by using SPSS software.

Results:

A total of 400 participants were enrolled in the study. Wherein 296 (74%) were females, and 104 (26%) were males. Of the 400 participants, 78 (19.5%), 263 (65.8%), and 59 (14.7%) had respectively low, moderate, and high levels of knowledge about the risk factors and warning symptoms of GC. The most highly recognized risk factors were family history of gastric cancer (83.8%), followed by alcohol drinking (81.8%), and smoking (80%). The most highly recognized warning symptoms were gastrointestinal bleeding (77%), followed by recurrent nausea and vomiting (74%) and abdominal lump (73.5%). Regarding their perception of the screening of GC, most of the participants thought that GC could be prevented (94.8%). Interestingly, only 11 participants underwent screening of GC (2.8%) among all participants.

Conclusion:

Good levels of knowledge about the risk factors and warning symptoms of GC were recorded to be moderate in most of the population in Makkah. However, the awareness about the importance of early screening of GC to prevent the possibility of disease occurrence is still a challenge for public health awareness.

Keywords:

gastric cancer, awareness, public knowledge, general population, Saudi Arabia.

Introduction

As stated by the last Global Cancer Statistics (GLOBOCAN 2018), incidence and mortality of cancer are highly increasing worldwide, in which there were 18.1 million new cancer cases and 9.6 million cancer deaths in 20181. Gastric Cancer (GC) is one of the most dangerous cancers worldwide that is responsible for over 1,000,000 new cases in 2018 and approximately 783,000 deaths, making it the third leading cause of cancer death, and the fifth most prevalent cancer, after lung, breast, prostate, and colorectal cancers[1]. These numbers showed a significant difference compared to the first estimates in 19752. There is a variation in the Incidence of GC from one country to another. The last estimates on GLOBOCAN 2018 released by the International Agency for Research on Cancer (IARC) published in 2019 reported 477 new cases and 392 deaths of GC in the Kingdom of Saudi Arabia (KSA) in 2018, ranked the 16th most prevalent cancer for both sexes[3], which reflects an increase in the incidence over the last decade.

It is well established that a high intake of a salty diet, lack of fresh fruits and vegetable intake, alcohol consumptions, and active use of tobacco are associated with increasing the chance of gastric cancer[4,5]. The main risk factor is Helicobacter pylori (H. pylori) infection[4-7]. This bacterium is responsible for about nearly 90% of new cases of non-cardia gastric cancer[6,7]. Moreover, genetic, and epigenetic factors are contributing to the progression of GC[8].

A study found that those aware of the association between H. Pylori infection and gastric cancer tend to undergo screening and receive treatment for H. Pylori infection more often than those who are unaware[9]. The most common symptoms of GC include upper abdominal pain, recent onset of indigestion, and weight loss. These symptoms may indicate other medical conditions; wherefore, People with these symptoms need to seek medical attention as soon as possible[10]. Awareness of these symptoms may lead to early diagnosis[11]; additionally, early stages of GC have a significantly better prognosis than advanced GC[12,13]. Hitherto, there is insufficient evidence to recommend endoscopic screening[14]; currently, the treatment of GC involves a combination of surgery, chemotherapy, and radiotherapy[15].

In two previous studies done in KSA, the knowledge and awareness of cancer among the participators were low and less than required[16,17]. No further studies have been done on the population of Makkah city, KSA. Hence, updated studies that assess GC awareness are necessary as a basis for future practices. Accordingly, this study

aims to assess the level of knowledge of risk factors, warning symptoms, and the screening attitude regarding GC among the general population in Makkah, KSA. Besides, to explore socio-demographic factors associated with the knowledge of GC.

Methods

Research design, Samples, and Population

This is a descriptive cross-sectional study that was conducted among the general population in Makkah, KSA. The minimum sample size required for this study was calculated by OpenEpi version 3.0118, in consideration of the following: the population size of the Makkah region is about 8.8 million inhabitants[19], keeping the confidence interval (CI) level at 95% and considering 50% prevalence of knowledge about GC. The sample size was calculated to be 385 participants. In case of any possible data loss, the total sample size came out to be 400 participants. We have included all members of the society who were eligible to answer our questionnaire. However, we have excluded any member with a previous history of cancers.

Questionnaire structure

The questionnaire was designed by Google forms[20] and distributed electronically via different platforms of social media. The language of the questionnaire was translated to Arabic (the native language of the participants), and then it was translated back to English for analysis and publication. The questionnaire was inspired by a previous study done in China [21] with some modifications related to the demographic data, and its reliability was evaluated. It was divided into four main sections. First section: the socio-demographic data, including [14] questions about gender, age, nationality, residence, marital status, educational level, occupation, income, working/studying in a medical field, family history of cancer or GC, health status, and any diseases of the upper gastrointestinal tract. Second section: identification of risk factors of GC, which included multiple-choice grid table with [16] risk factors, each risk factor consisted of three optional answers ("Yes," "No," and "Not sure/Do not know"), the risk factors were: old age, male gender, H. pylori infection, stomach ulcer, previous stomach surgery, atrophic gastritis, Family history of gastric cancer, salty diet, consumption of pickled foods, consumption of smoked foods, Irregular diet, frequent eating of leftovers, smoking, drinking, stress and frequent midnight snacking. Third section: identification of the warning symptoms of GC, including multiple-choice grid table with six warning symptoms and the same optional answers of the previous part, warning symptoms

were: gastrointestinal bleeding, abdominal lump, abdominal pain, upper abdominal fullness, weight loss, and recurrent nausea and vomiting.

Fourth section: perceptions on the screening for GC, consists of 6 multiple of choice questions, the first four of them were "yes, no" questions, included: do you think gastric cancer can be prevented? Do you think early gastric cancer can be cured? Do you think screening can help detect early gastric cancer? have you ever undergone gastric cancer screening? While the last two questions of this part were: why do you not undergo screening for gastric cancer? (Answers were: "do not know the benefits of screening," "fear of undergoing gastroscopy," "worried about screening results," "no symptoms," "no time," and "financial limitations"), and which screening method for gastric cancer would you prefer? (Answers were: "gastroscopy," "blood test," and "none of them"). To assess the population's knowledge about risk factors and warning symptoms of GC, 22 risk factors and warning symptoms were listed in a multiple-choice grid table. One point was given for each of the factors or symptoms that the participant agreed to. For each participant, a maximum score of 22 was calculated. The participants' knowledge was then categorized into three groups: Low level (0-7 points), Moderate level (8-14 points), and High level (15-22 points).

Statistical methods

Data were collected via an Excel sheet and then analyzed using Statistical Package for social studies (IBM SPSS) version-23, Armonk, New York, IBM Corporation, USA. Variables were presented in numbers and percentages. A Chi-square test was used to examine the association between gastric cancer knowledge and different socio-demographic data. A statistical significance was determined at $p < 0.05$.

Ethical Approval and Informed Consent

This research is exempted from research and ethical committee or an institutional review board (IRB) approval. https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html

An electronic informed consent was obtained from each participant prior to answering the questionnaire. Confidentiality was assured. Names or phone numbers were not requested from any participant.

Results

Socio-demographic characteristics of the participants

A total of 400 participants were enrolled in the study. Table 1 represents the socio-demographic characteristics of all participants.

The participants' age ranged from 14 to 65 years, and most of them were between

Table 1: Socio-demographic characteristics of the participants (n=400)

Characteristic		Number (%)
Age	< 18	4 (1)
	18-25	291 (72.8)
	26-35	30 (7.5)
	36-45	40 (10)
	> 45	35 (8.7)
Gender	Male	104 (26)
	Female	296 (74)
Nationality	Saudis	377 (94.3)
	Non-Saudis	23 (5.8)
Residence	City	370 (92.5)
	rural areas	30 (7.5)
Marital status	Single	295 (73.8)
	Married	92 (23)
	divorced /widow	13 (3.2)
Educational level	intermediate school or below	13 (3.2)
	High school	96 (24)
	College or above	291 (72.8)
Occupation	Non-working	6 (1.5)
	Retired	11 (2.7)
	Housewife	16 (4)
	Student	281 (70.3)
	Fieldwork	36 (9)
	Health care provider	14 (3.5)
	Private job	11 (2.7)
	Office work	25 (6.3)
Income	< 5000 SAR	185 (46.3)
	5000 - 10,000 SAR	55 (13.8)
	> 10,000 SAR	56 (14)
	No Income	104 (26)
Work/study in a medical field	Yes	266 (66.5)
	No	134 (33.5)
Family history of cancer	Yes	135 (33.8)
	No	243 (60.8)
	I do not know/ not sure	22 (5.5)
Family history of GC	Yes	28 (7)
	No	317 (79.3)
	I do not know/ not sure	55 (13.7)
Health status	Unhealthy	8 (2)
	Suboptimal	117 (29.3)
	Healthy	275 (68.8)
Diseases of the upper gastrointestinal tract	Yes	68 (17)
	No	332 (83)

18-25 years (291, 72.8%). There were 296 (74%) female participants, while 104 (26%) were male. Most of the participants were Saudis (377, 94.3%), and 370 (92.5%) were residents in a city not in rural areas, as well as 295 (73.8%) were single. The educational level of 291 participants was a college or above (72.8%), and 281 participants were students (70.3%). The total income of 185 participants (46.3%) was less than 5000 SAR, 266 (66.5%) participants worked/studied in the medical field. The exact 135 (33.8%) participants have had a family history of cancer, while 28 (7%) had a family history of GC. Most of the individuals were healthy (275, 68.8%), and 53 participants (13.3%) have complained of upper gastrointestinal tract diseases.

Knowledge about risk factors and warning symptoms of GC

Table 2 represents the participants' knowledge about risk factors and warning symptoms of GC.

Table 2: participants' knowledge about risk factors and warning symptoms of GC (n=400)

Category	Number (%)
Risk Factors of GC	
Family history of gastric cancer	335 (83.8)
Alcohol Drinking	327 (81.8)
Smoking	320 (80)
H. pylori infection	262 (65.5)
Stomach ulcer	256 (64)
Atrophic gastritis	194 (48.5)
Stress	192 (48)
Older age	190 (47.5)
Consumption of smoked foods	138 (34.5)
Previous stomach surgery	126 (31.5)
Irregular diet	87 (21.8)
Frequent eating of leftovers	87 (21.8)
Consumption of pickled foods	76 (19)
Male sex	69 (17.3)
Salty diet	55 (13.8)
Frequent midnight snacking	54 (13.5)
Warning Symptoms of GC	
Gastrointestinal bleeding	308 (77)
Recurrent nausea and vomiting	296 (74)
Abdominal lump	294 (73.5)
Weight loss	265 (66.3)
Abdominal pain	234 (58.5)
Upper abdominal fullness	177 (44.3)

From the total of 400 participants, 78 (19.5%), 263 (65.8%), and 59 (14.7%) had respectively low, moderate, and high levels of knowledge about the risk factors and warning symptoms of GC (Fig. 1.). Only 3 participants had the full score (22 points). While 6 participants had zero in their score. The most highly recognized risk factors were family history of gastric cancer (83.8%), followed by alcohol drinking (81.8%), smoking (80%), H. pylori infection (65.5%), and stomach ulcer (64%). Less well-recognized risk factors included frequent midnight snacking (13.5%), salty diet (13.8%), and male sex (17.3%). The most highly recognized warning symptoms were gastrointestinal bleeding (77%), followed by recurrent nausea and vomiting (74%) and abdominal lump (73.5%). On the other side, less well-recognized warning symptoms include upper abdominal fullness (44.3%) and abdominal pain (58.5%).

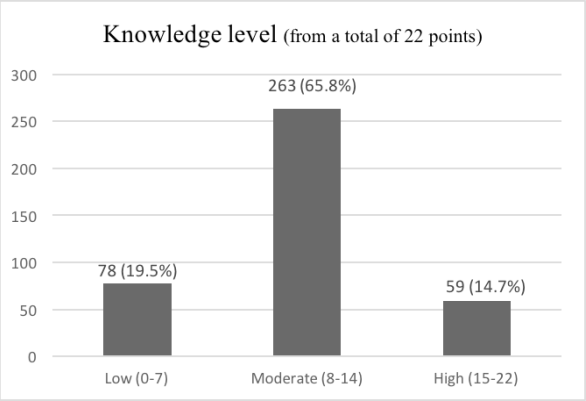


Fig. 1: Represents the participants' levels of knowledge

Participants perceptions on the screening of GC

Table 3: participants' perception about GC screening (n=400)

Question	Number (%)
Is there a way to prevent GC?	
Yes	379 (94.8)
No	21 (5.2)
Can we detect GC early by screening?	
Yes	389 (97.3)
No	11 (2.7)
Can early stage of GC be cured?	
Yes	388 (97)
No	12 (3)
Have you ever participated in GC screening?	
Yes	11 (2.8)
No	389 (97.3)
Why did you not undergo gastric cancer screening? (This question is only for the 389 participants who did not undergo screening)	
No symptoms	254 (65.3)
No time	51 (13.1)
Fear of undergoing gastroscopy	34 (8.8)
Do not know the benefits of screening	25 (6.4)
Financial limitations	18 (4.6)

Question	Number (%)
Worried about screening results	7 (1.8)
Which screening test for GC would you prefer?	
Blood test	209 (52.3)
Gastroscopy	160 (40)
None of them	31 (7.8)

As represented in Table 3, most of the participants (94.8%) thought that GC could be prevented, 389 (97.3%) thought GC could be detected early, and only 12 (3%) thought early GC could not be cured. Furthermore, only 11 (2.8%) participants underwent GC screening, all of whom were older than forty years, which is the recommended age range for GC screening. Of the 389 participants who did not undergo screening, they were asked about the reason, and the commonest answers were: no symptoms (65.3%), no time (13.1%), and fear of undergoing gastroscopy (8.8%). All the participants were asked about the most preferred screening test for GC, 209 (52.3%) preferred blood test, 160 (40%) preferred gastroscopy as a first option, while 31 (7.8%) chose 'none of them.'

Association between GC knowledge and socio-demographic data of the participants

The outcome analysis for factors associated with knowledge of risk factors and warning symptoms of GC is represented in Table 4.

Table 4: Outcome analysis for factors associated with GC knowledge

Variable	Low, n (%)	Moderate, n (%)	High, n (%)	P value
Gender				
Male	39 (37.5)	58 (55.8)	7 (6.7)	p= 1.369
Female	39 (13.2)	205 (69.3)	52 (17.6)	
Age				
< 18	0 (0.0)	4 (100)	0 (0.0)	* p= 0.034
18-25	55 (18.9)	198 (68.0)	38 (13.1)	
26-35	5 (16.7)	22 (73.3)	3 (10.0)	
36-45	10 (25.0)	24 (60.0)	6 (15.0)	
> 45	8 (22.9)	15 (42.9)	12 (34.3)	
Residence				
City	70 (18.9)	244 (65.9)	56 (15.1)	p= 0.502
Rural areas	8 (26.7)	19 (63.3)	3 (10.0)	
Educational level				
intermediate school or below	1 (33.3)	2 (66.7)	0 (0.0)	p= 0.567
High school	16 (16.7)	69 (71.9)	11 (11.5)	
College or above	61 (20.3)	192 (63.8)	48 (15.9)	

Variable	Low, n (%)	Moderate, n (%)	High, n (%)	P value
Occupation				
Non-working	1 (16.7)	4 (66.7)	1 (16.7)	* p= 0.019
Retired	1 (9.1)	4 (36.4)	6 (54.5)	
Housewife	0 (0.0)	14 (87.5)	2 (12.5)	
Student	54 (19.2)	191 (68.0)	36 (12.8)	
Field work	10 (27.8)	18 (50.0)	8 (22.2)	
Health care provider	3 (21.4)	8 (57.1)	3 (21.4)	
Private job	2 (18.2)	9 (81.8)	0 (0.0)	
Office work	7 (28.0)	15 (60.0)	3 (12.0)	
Income				
< 5000 SAR	39 (21.1)	125 (67.6)	21 (11.4)	* p= 0.003
5000 - 10,000 SAR	18 (32.7)	31 (56.4)	6 (10.9)	
> 10,000 SAR	8 (14.3)	32 (57.1)	16 (28.6)	
No Income	13 (12.5)	75 (72.1)	16 (15.4)	
Work/study in a medical field				
Yes	56 (21.1)	174 (65.4)	36 (13.5)	p= 0.408
No	22 (16.4)	89 (66.4)	23 (17.2)	
Family history of GC				
Yes	6 (21.4)	13 (46.4)	9 (32.1)	* p= 0.024
No	61 (19.2)	209 (65.9)	47 (14.8)	
Don't know/not sure	11 (20.0)	41 (74.5)	3 (5.5)	

Asterisk symbol (*) indicate the statistically significant findings ($p<0.05$).

More than half of the participants aged between 18-25 years had recorded moderate levels of knowledge (68%), with a statistically significant p-value of 0.034. Regarding participants' occupation, most students had moderate levels of knowledge (191, 68%), with a recorded statical p-value of 0.019. Participants who reported to have an income of less than 5000 SAR were also recorded the most levels of moderate levels of knowledge (125, 67.6%) compared to 39 participants (21.1%) who had low levels of knowledge, with a statical significance p-value of 0.003. Other associations between knowledge of risk factors and warning symptoms of GC and socio-demographic data of the participants are shown in Table 4.

Discussion

GC is still spreading worldwide, and the newly discovered cases annually increase the importance of public awareness towards the symptoms, screening, and available medical treatment. The early detection of GC to prevent, diagnose, and provide medical treatment is important. Therefore, during this study, it is clear there is a good level of knowledge towards the disease itself, but the awareness of the risk factors to prevent the possibility of disease occur-

rence is still a challenge for public health awareness programs. A high intake of salty diet, lack of fresh fruits and vegetable intake, alcohol consumption, and active use of tobacco are associated with increasing the chance of gastric cancer; a healthy diet and lifestyle are a must. Nevertheless, public understanding of the need for early GC screening, especially for high-risk individuals, remains a challenge for public health awareness.

As previously stated, our findings revealed that the mean score for GC knowledge was $^{10.7}$. And a total of 14.7% of the participants were recorded to have a low level of knowledge. This result is considered a good level of knowledge, and it is substantially higher than a previous study performed among China's general population[21]. They reported a mean score of 8.85/22 (SD 6.48), with a low level of knowledge within 47% of their participants. This might be because of the large number of educated people who participated in our study, as 72.8% of our participants were studied in a college or above. On the contrary to the Chinese study, our findings were consistent with other studies conducted among Korean and Iranian populations[22,23].

Regarding GC screening, our findings revealed only 2.8% of the participants had undergone gastric cancer screening, while 15.2% had undergone the screening of gastric cancer among China's general population[21]. These results indicated the public need for awareness regarding the importance of early screening to avoid possible disease complications. Our results showed that the knowledge of GC was differed according to the socio-demographic characteristics of the participants, which were also reported in some previous studies[21,24]. In particular, our findings revealed that younger individuals were more knowledgeable about GC than middle-aged and older individuals; this finding is concerning as GC is much more prevalent in individuals over the age of 40 years[25]. Accordingly, we recommend awareness programs to educate the public and focus more on the age group of 40 years and above. Moreover, participants' occupation, level of income, and having a previous family history of GC were reported in our findings to be significantly associated with the knowledge of GC. An additional association was reported in a previous study between the level of knowledge and gender[21], where females were found to have better levels of knowledge than males.

To the best of the authors' knowledge, the following study is the first study conducted among the general population in Makkah city, KSA, to assess their level of knowledge about GC. Nevertheless, we announce certain limitations in our study.

First, the majority of responders were highly educated. Therefore, our results may not apply to all different structures of the population. Secondly, the small sample size of our study may increase the chance of errors. Therefore, we recommend conducting similar studies extended to the community with a larger sample size to confirm our results.

Conclusion

Good levels of knowledge about the risk factors and warning symptoms of GC were recorded to be moderate in most of the population in Makkah. However, the awareness of some risk factors and the importance of early screening for GC, especially for high-risk individuals, is still a challenge for public health awareness. We recommend conducting similar studies extended to the community with a larger sample size to confirm our results.

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