

RESEARCH ARTICLE

Knowledge about Gastric Carcinoma in North of Iran, A High Prevalent Region for Gastric Carcinoma: A Population-Based Telephone Survey

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Abstract

Background & Objectives: The most northern and northwestern regions of Iran are at a high risk for gastric cancer. The aim of this study was to assess the general population's awareness about risk factors, symptoms and signs, preventive methods and management of gastric carcinoma in a high prevalence city in the North of Iran. **Methods:** A cross-sectional population-based telephone survey which was conducted on 3,457 residents of Rasht, the capital city of Guilan Province, to assess their awareness regarding gastric carcinoma. The questionnaires contained demographic data and statements on respondents' knowledge about risk factors, symptoms and signs, prevention and management of gastric cancer which were filled by general practitioners after asking the subjects. Data were analyzed in SPSS14. $P < 0.05$ was considered significant. **Results:** The mean knowledge score of the respondents was 5.05 ± 1.37 regarding risk factors of gastric carcinoma, 4.39 ± 1.99 regarding symptoms and signs, 6.0 ± 1.22 regarding preventive strategies, and 1.6 ± 1.16 regarding management. Totally the mean knowledge level of the respondents toward gastric carcinoma would be 17.1 ± 3.97 from the maximum grade of 29. The age group of 45-55 y/o, bachelor degree and higher, physicians and nurses, those who had cancer history in friends or had the history of gastrointestinal diseases showed significantly higher knowledge scores ($P = 0.001$). **Conclusion:** There is a general lack of awareness of cancer risk factors, symptoms and signs, methods of prevention, and importance of early diagnosis and treatment. Educational programs should be developed to promote adherence to recommended screening guidelines.

Keywords: Knowledge - gastric carcinoma - population based planning - Iran

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Introduction

Although the worldwide incidence and mortality of gastric cancer has been decreasing gradually it still remains the fourth most common cancer and the second most common leading cause of cancer death causing more than 700,000 deaths annually worldwide. The most incidence rate of gastric cancer has been reported in Japan, China, South America, Eastern Europe, and Middle East (Parkin et al., 2001; Triantafyllidis and Cheraçakis, 2004; Crew and Neugut, 2006; Matsuzaka et al., 2007; Maconi et al., 2008; Kwon et al., 2009). Although incidence rate of gastric cancer has decreased in the western world, its incidence and mortality have increased or remained stable in the middle and low income countries (Parkin et al., 2005). The burden of cancer is increasing in economically developing countries as a result of population aging and growth as well as, increasingly, an adoption of cancer associated lifestyle choices including smoking, physical inactivity, and "westernized" diets (Jemal et al., 2011).

A high incidence of stomach cancer was reported from different geographic areas in Iran (Sadjadi et al., 2005; Mohagheghi et al., 2009). In the study in Semnan, gastric cancer was the most common tumor with an incidence rate of 19.7 per 100,000 people (Babaei et al., 2005). Most northern and northwestern regions of Iran are at a high risk for gastric cancer. A strong spatial clustering of gastric cancer in both men and women has been described in Mazandaran and Golestan, two provinces located on the Caspian Sea shore line (Malekzadeh et al., 2009). The highest incidence rate of gastric cancer in Iran is reported 49.1 per 100,000 in men and 25.4 per 100,000 in women in Ardebil (a north western province) (Sadjadi et al., 2003). In contrast to the northern areas, Kerman, a province in the south, shows a lower incidence rate of gastric cancer with an ASR of 10.2 and 5.1 in men and women respectively (Kolahdoozan et al., 2010). Epidemiologic surveys have reported environmental factors and diet effective on the incidence of gastric cancer. Also *Helicobacter Pylori* infection can cause chronic gastritis and more serious

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pathologies as gastric carcinoma (Brown, 2000; Correa et al., 2004; Forman and Burley, 2006; Shikata et al., 2006; Oh DY et al., 2009). As the early gastric cancer is asymptomatic or has non-specific symptoms, its diagnosis is usually made in the advance stages with a reported 5-year survival rate of less than 30% in most series. The symptoms presents with dyspepsia, abdominal fullness, upper abdominal discomfort, and alarm sings as weight loss, dysphagia, gastrointestinal bleeding, palpable mass and anemia which make patients refer to physicians for more assessments (Bowrey et al., 2006; Maconi et al., 2008). Undoubtedly primary and secondary preventive activities decrease the burden of cancer patients to the hospital and minimize human suffering (Puri et al., 2010). The control of cancer requires the effective implementation of knowledge. It's now known that over one third of cancers are preventable and one third potentially curable provided they are diagnosed early (Bhardwaj, 2010).

For prevention of gastric cancer public awareness of the risk factors is needed. However, studies on the issues on gastric cancer are rare. In particular, informative studies are not available on the level of public awareness of risk factors or perception of self-risk. Also for the prevention of gastric cancer the general population should be aware of the early signs and symptoms of the disease. Keeping the same as the reference, the present study was planned to assess the knowledge of the general population about gastric cancer in a region with a relatively high incidence of gastric cancer. Results of such study will lead to appropriate priority setting for research and cancer control programs. So that new strategies will arise to progress people level of awareness and this will help in early diagnosis, disease surveillance and to some extent in the prevention of gastric carcinoma among general population.

Materials and Methods

Guilan (Gilān) is one of the Northern provinces of Iran. It is about 235 kilometers long and between 25-105 kilometers wide. This province lies along the south and south-west borders of Caspian Sea and from the north it is surrounded by Alborz Mountain. It is between Mazandaran province in the east and Ardabil province in the west. It is more than 14000 square kilometer and has a population about 2.5 millions (49.8% male, 50.2% female). Rasht is the capital city of the province which is located at the center of it.

Study design: A cross-sectional population-based telephone survey was conducted on 3457 residents of Rasht city- Guilan province in a one year period (2011-2012) to assess their level of knowledge regarding gastric carcinoma. In the study, telephone numbers were selected systematically from Rasht telephone directory. All of the interviews were made by two trained general practitioners from Gastrointestinal and Liver Diseases Research Center of Guilan University of Medical Sciences. First of all the objectives of the survey were explained to the responders and Persons telephoned were asked if they would be prepared to help research by answering some questions.

Those who did not consent to answer the questions were excluded.

Sample size: The sample was calculated 3457 people from the general population of Rasht city-Guilan province based on the knowledge level of people among the pilot group (p=10%) and considering the precision of 0.01 and the type one error of 0.05. The sampling was done in a systematic random sampling method. The first number was selected randomly and it entered the study together with the two subsequent numbers. After a 20-number interval from the third number, three other subsequent numbers were entered the study and this process continued to reach the 3457th number.

Questionnaire: Questionnaires contained two parts: the demographic data and the data on their awareness regarding gastric carcinoma. It was derived from reference books of gastroenterology diseases and related articles and was validated scientifically by professors of internal medicine and epidemiology. Demographic data contained responders' age, gender, education, and occupation. Also respondents' past medical history and family history of gastrointestinal diseases were recorded. Their awareness regarding gastric carcinoma was categorized in four groups; Risk factors (8 statements), symptoms and signs (9 statements), prevention (9 statements), and management (3 statements).The maximum grade of knowledge would be 29 (Table 1).

Before the study, a pilot phase was conducted on 20

Table 1. Questions on Responders' Knowledge about Gastric Carcinoma

	Y	N	IDK
Risk factors of gastric carcinoma			
1. Diet containing spicy and smoked food can cause gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Diet containing nitrates such as sausage, baloney,...Can have role in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Freezing food by chemical substances can be a risk factor of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Cigarette smoking has a role in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Drinking cold water has a role in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Drinking alcohol has a role in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Gastric infection is a risk factor of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Family history of gastric carcinoma is a risk factor of carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Symptoms and signs of gastric carcinoma			
1. Weight loss is a symptom of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Dysphagia is detected in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Early satiety is a symptom of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Abdominal fullness is a symptom of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Hematemesis is seen in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Arthralgia and skin darkness are of gastric carcinoma symptoms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Blood in stool is seen in gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Recurrent nausea and vomiting are of gastric carcinoma symptoms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Gastric carcinoma causes anemia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prevention			
1. Fresh fruit and vegetables prevent gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Antibiotics for management of gastric infection prevent gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Smoking cessation helps in prevention of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Alcohol cessation helps in prevention of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Eating fresh meals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Preventing teeth infection can prevent gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Decreasing using frozen food prevents gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. If there is a family history of gastric cancer, follow up is needed in other members of the family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Eating spicy and smoked food decreases gastric carcinoma incidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Management			
1. Gastric carcinoma has treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Surgery is used for the management of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Chemotherapy and radiotherapy is effective in management of gastric carcinoma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Y=yes, N=No, IDK=I don't know.

persons. They were interviewed by telephone, and after 2 weeks they were asked again the same questions on the phone, and the answers were the same as the first answers. By this way the reliability and appropriateness of the study were assessed.

The questionnaires were filled by two trained general practitioners from Gastrointestinal and Liver diseases Research Centre of Guilan University of Medical Science. Data analysis: After filling the questionnaires, every respondent was scored and their mean knowledge score was recorded. The level of knowledge and the relationship of knowledge and variables such as demographic data, source of information and past history were analyzed in SPSS version 14 by descriptive statistics (mean, standard deviation) and comparison means (One Way ANOVA Test). $P < 0.05$ was considered significant.

Results

A total of 3457 persons were interviewed. There were 2599 (75.2%) females and 857 (24.8%) males. The mean age of the respondents was 38.08 ± 13.59 years. The maximum age of them was 85 years; compared to the minimum age of 13 years.

The mean knowledge score of the respondents was 5.05 ± 1.37 regarding to the risk factors of gastric carcinoma, 4.39 ± 1.99 regarding to the symptoms and signs of the gastric carcinoma, 6.0 ± 1.22 regarding to the preventive strategies, and 1.6 ± 1.16 regarding to the treatment. Totally the mean knowledge level of the respondents toward gastric carcinoma would be 17.11 ± 3.97 from the maximum grade of 29, and 1714 (49.6%) of the subjects achieved grades lower than the mean score while 1742 (50.4%) got upper mean knowledge scores.

The highest percentage of correct answer in the field of gastric cancer risk factors was related to the role of smoking on gastric cancer (91.7%). In the field of the symptoms and signs of gastric cancer, the highest percentage of correct answer (74.4%) was associated to the anemia. The highest percentage of correct answer regarded to the field of prevention (91.6%) was associated to the role of smoking cessation on the prevention of gastric carcinoma, and in the field of management, the highest percentage of good knowledge (59.8%) was related to the statement that "gastric cancer is curable". Table 2 shows mean score of knowledge regarding to demographic variables.

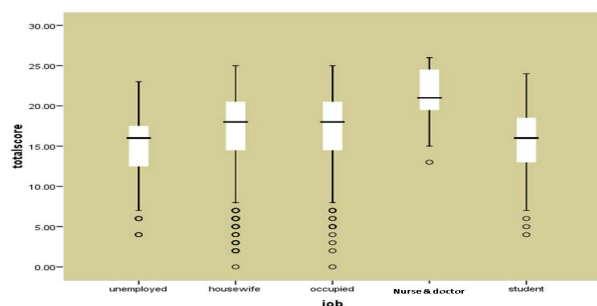


Figure 1. Mean Knowledge Score of the Resident of Rasht City According to the Occupation of the Participants.

Table 2. Mean Knowledge Score Regarding to Demographic Variables

	Frequency	Knowledge		P value
		Mean	SD	
Gender: Male	857	16.93	4.05	0.001
Female	2599	17.18	3.95	
Age group: <25	676	15.48	3.7	0.001
25-35	999	16.8	3.75	
35-45	817	17.73	3.88	
45-55	574	18.26	3.83	
55-65	282	17.86	4.23	
>65	108	17.48	4.67	
Education: Illiterate	124	15.9	5.14	0.001
Elementary & high school	988	16.7	4.15	
Diploma and higher	1614	17.3	3.81	
Bachelor degree and higher	730	17.69	3.76	
occupation: Not occupied	152	15.5	4.08	0.001
Housewife	1859	17.09	3.96	
Occupied	1107	17.55	3.87	
Physician and nurse	49	21.38	2.95	
University student	316	15.82	3.6	
Cancer history in the family: No	3384	17.13	3.97	0.001
Yes	72	16.4	3.71	
Cancer history in friends: No	3322	17.06	3.98	0.001
Yes	134	18.44	3.36	
History of gastrointestinal disease: No	2835	16.99	3.96	0.001
Yes	621	17.67	3.97	

Figure 1 shows the percentages of knowledgeable subjects associated to the different occupations. The physicians and nurses were the most knowledgeable and the subjects who were not occupied were the least knowledgeable groups.

In this study, 109 (3.2%) of the participants told that they received their awareness of gastric cancer from radio, 1114 (54.5%) from TV, 398 (11.5%) from magazines, 54 (1.6%) from internet, 77 (2.2%) of them got the knowledge from the physicians, 604 (17.5%) from friends, and 331 (9.6%) of them referred to none of the above sources. Among them those who had used magazines as the source of information significantly had higher knowledge score (18.69 ± 3.56) and those who had received their information from friends were the least knowledgeable (16.78 ± 3.82) ($P < 0.0001$).

Discussion

WHO estimates that cancer burden would increase to 20 million by 2020 with 70% in the developing world. The burden of cancer is increasing in developing countries as deaths from infectious diseases and childhood mortality are declining and more people live to older ages when cancer most frequently occurs (Puri et al., 2010).

The likelihood of cure from cancer is usually dependent on the stage of disease at diagnosis. Some patients attend their general practitioner with a long preceding history of cancer symptoms. This may be due in part to a lack of recognition of the seriousness of the symptoms (Adlard and Hume, 2003). We have conducted a survey of 3457 adult people of general population in a high prevalent area of gastric cancer to determine their awareness of risk factors, presenting symptoms, and management for

gastric cancer.

In the present study, the total grade of knowledge of general population in Rasht city, a prevalent region for gastric cancer was not optimal and almost only half of the responders achieved grades higher than the mean knowledge score. A study in Delhi on awareness of cancer among college youths reflected the overall low level of knowledge among the college youth on various aspects of cancer. The knowledge score classification shows that none of the respondents qualified for "good knowledge score", they all fall on the average line (Bhardwaj, 2011). It was seen that youth were also not well aware of the warning signals of cancer.

In our study only 59.8% of the respondents knew that gastric cancer is curable. In a survey in West Bengal the percentage of the respondents believed that most of the cancer is curable in early stage was 58% (Ray and Mandal, 2004) (nearly the same as the present study). In a study by Bhurgri et al. (2008) in Pakistan on the Awareness of cancer risk factors among patients a large number of respondents were aware of benefits of early cancer diagnosis, which is comparable to a cross-sectional study in UK indicating 91.7% females were of the opinion that cancer can be treated if detected early. The likelihood of cure from cancer is usually dependent on the stage of disease at diagnosis (Yardley et al., 2000).

Some patients attend their general practitioner with a long preceding history of cancer symptoms. This might be due in part to a lack of recognition of the seriousness of the symptoms, while many cancers could be identified on routine check-ups. Ignorance, embarrassment and fear probably all contribute to patient delay in seeking advice about colorectal cancer symptoms (Yardley et al., 2000).

In Ray's study, only 35% of the respondents knew the primary symptoms of cancer, and only 44% knew the major risk factors of the cancers (Ray and Mandal, 2004), while in the present study the mean score of the respondents on the field of gastric cancer risk factors was 5.05 ± 1.37 from the maximum of 8 that was not desirable and also they didn't get good score on the field of symptoms (4.39 ± 1.99 from 9) and In the field of the symptoms and signs of gastric cancer, the highest percentage of correct answer (74.4%) was associated to the anemia. In a study by Puri et al. (2010) on knowledge of cancers and its risk factors in India, 1062 (78.6%) respondents knew that cancer can be symptomatic. Subjects were asked about seven cardinal symptoms of cancer recommended by WHO. Most common symptoms according to them were unusual swelling 897 (66.4%) followed by blood in vomiting 800 (59.2%). Cachexic features were known to less than 1/2 of respondents. In a study by Yardley on colorectal cancer symptoms in a UK population (Yardley et al., 2000), only 31% of respondents were able to state a symptom of colorectal cancer. The most likely explanations were lack of knowledge and embarrassment about stating a symptom.

In the present study the highest rate of correct answers in the risk factor field was associated with the smoking role in gastric carcinoma (91.7% with correct answer). In the study of Puri et al. (2010) 74.7% of the total respondents could correlate cigarette/cigarette smoking to be causing

cancer. This was also in similarity to the results of study done in Delhi, where almost 90% know about tobacco to be a risk factor for cancer (Seth et al., 2005). In Bhurgri's et al. survey (2008), sample also had sufficient awareness about these two major risk factors, the tobacco smoke and use of areca nut. Undoubtedly, the burden due to smoking related cancers is increasing throughout the world and tobacco control would be a cost benefit way to fight against cancer (Puri et al., 2010). The knowledge about the possible causes of cancer may bring behavioral changes among the masses cutting short the possibility of behavior risks (Bhardwaj, 2011).

To reduce gastric cancer mortality, reversible risk factors should be modified and regular screening should be performed. To achieve this goal, public education should be undertaken as a high level of public awareness of risk factors is required (Oh Dy et al., 2009). It is important to determine current levels of risk factor awareness and perceptions of screening programs intended for the general population. However, the extent of public awareness of the risk factors of gastric cancer has not been well studied.

In the present study, the gender of female and middle age group (45-55y/o) were significantly more knowledgeable people about gastric cancer ($p=0.001$). Also, higher education and working in health care system were significantly associated with higher knowledge score, and those who had history of gastrointestinal or cancer history in their friends were more knowledgeable ($P=0.001$). In the study of Adlard and Hume, (2003). on Cancer knowledge of the general public in the United Kingdom, significant deficiencies were identified in the cancer knowledge of respondents. Personal or family history of cancer, younger age and female sex were associated with improved cancer awareness. Also in Yardley's study demographic differences among respondents were associated with substantial differences in knowledge of colorectal cancer symptoms. Thus, while 56% of females aged over 45 years stated a colorectal cancer-associated symptom, this fell to 13% among males aged less than 45 years. However, there was a significant improvement in knowledge of gastric cancer symptoms with age, suggesting that knowledge was also acquired throughout the life. This is relevant because cancers like gastric and colorectal cancers are mainly disorders of middle and old age, and symptoms that can be associated with gastric and colorectal cancer do not require urgent investigation in young people without a cancer family history. Thus, public education about gastric and colorectal cancer symptoms should focus on the middle aged population. The finding of greater knowledge of gastric cancer symptoms among women than men in this region could be due to increased awareness about body health among women due to spending more free time at home (Yardley et al., 2000).

In this study, the highest percentage of the participants had received their cancer awareness from TV (54.5%) and 3.2% of the participants told that they received their awareness of gastric cancer from radio, 11.5% from magazines and only 1.6% of them got their knowledge from internet. In Bengal survey, only 37.33% of respondents had listened to any cancer awareness program

conducted by radio, only 36.33% had seen any cancer awareness program conducted by TV channels, and 34% had read cancer awareness articles in magazines (Ray and Mandal, 2004). The high proportion of participants who had received their knowledge of cancer from TV in the present study could infer the educational programs which are broadcasted from local TV channel in Guilan Province.

The basic level of cancer knowledge of the population is as important in controlling cancer as diagnostic tools, screening, and new approaches to prevention, early diagnosis and treatment. To draw any final its necessary to start population/community based cancer literacy programs which aims at: a) Creating public awareness about established risk factors of cancer as a Cancer Control Programs (e.g. tobacco cessation). b) Creating public awareness about the symptoms of gastric cancer for down staging. c) Creating public awareness about the usual side effects of cancer therapy and to make them understand the importance of continuation of treatment despite the potentially curable side effects (Ray and Mandal, 2004).

This study has some limitations. The questions were somewhat subjective. For example, a 'salty diet' or 'spicy diet' is not well defined, so the respondents may have different concepts on the definition. A more objective method would be to define the use of 'salty' or 'spicy' in quantitative terms. Also this study was not able to establish the characteristics of those who did not or could not answer the questions, or to assess more subtle factors such as the contributions of cultural background, embarrassment and fear to the answers given.

Most of the studies conducted are restricted either to one aspect of cancers for example one special risk factors, but the present study investigated public awareness on four fields related to gastric cancer including risk factors, symptoms, prevention and management. Another advantage of this study is that it was a population-based telephone survey which was performed in a large population who live in an area with high prevalence of gastric cancer. So the results give a precise idea about the awareness of gastric cancer among the study group.

In conclusion, there is a general lack of awareness of cancer risk factors, symptoms and signs, methods of prevention, and the importance of early diagnosis and management in the studied population. This knowledge is essential if proper implementation of a cancer screening program is to be carried out, and if preventable cancers are to be controlled. Undoubtedly single largest predictor of cancer patient survival is early diagnosis and management. Especially in developing countries owing to recourse crunch for diagnostic and treatment facilities, primary prevention has to be emphasized. So educational programs should be developed to promote primary prevention of the disease.

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