

## Do Clinical and Demographic Features of Patients with Upper-Gastrointestinal Cancer Affect their Health-related Quality of Life?

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### ABSTRACT

**Background:** Oesophagogastric (OG) cancer as a globally common and deadly malignancy, which is widely spread in Northeast Iran, has an extensive impact on health-related quality of life (HRQL). Demographic and histopathologic changes have been apparent in oesophagogastric cancer, therefore. HRQL could be used, as an outcome, to assess and determine the efficacy and impact of cancer care.

**Methods:** A consecutive sample of upper-gastrointestinal cancer patients admitted to the main oncology/ radiotherapy departments in the North-East of Iran were recruited into the study. All participants completed the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 and QLQ-OG25 questionnaires in a face to face interview.

**Results:** Of the total 275 patients participated in the study, 54% had oesophageal, 34% stomach and 12% OG junction cancers. About 73.1% had TNM (tumour, node, metastasis) staging; of which 69% were in stage III and IV. The most common type of cancer in oesophagus was SCC (95.3%) in lower third, ADC in stomach (97.8%) and in the OG junction (93.8%). Patients with stomach or OG junction tended more to present in higher stages ( $P < 0.001$ ). Unlike QLQ-C30, the EORTC QLQ-OG25 was able to differ patients significantly in anxiety scale ( $P = 0.01$ ), body image, chocking and weight loss ( $P < 0.05$ ). Those who had self care ability had better quality of life scores ( $P < 0.001$ ) in more scales and items.

**Conclusion:** SCC is predominant type of upper GI cancer in Khorasan provinces similar to the high risk area in Northern Iran. The specific health-related quality of life tool (EORTC QLQ-OG25) was able to distinguish most of the symptoms in patients with upper GI cancer.

**Key words:** Iran, health-related quality of life (HRQOL), oesophagogastric cancer, upper-gastrointestinal cancer

### INTRODUCTION

Oesophagogastric cancer which may occur in oesophagus,

oesophagogastric junction and stomach, including proximal and distal stomach,<sup>[1]</sup> has been estimated globally to happen in about 1400 000 new cases in 2008.<sup>[2]</sup> Squamous cell carcinoma (SCC) in the oesophagus and adenocarcinoma (ADC) in the stomach are the most common clinicopathological features.<sup>[1]</sup> Oesophageal and gastric cancers are both common and deadly in Iran.<sup>[3]</sup> Geographically, upper GI cancer prevalence varies and high incidences are seen in Asia, Africa and Iran.<sup>[2]</sup> In recent decades, there were demographic and histopathologic changes in oesophagus and gastric cancers.<sup>[3,4]</sup> Over the past five decades, the incidence and mortality of gastric cancer has fallen substantially in many regions, but remains the second most cause of death from cancer worldwide.<sup>[3]</sup> Oesophageal and gastric cancers are two of the five most common cancers<sup>[5]</sup> accounted for more than 15% of the total cancers registered in Iran in 2008, while Upper GI cancer causes 55% of all cancer-related deaths in Iran.<sup>[6]</sup> However, there were considerable variations in the sub-sites of upper GI cancer.<sup>[7,8]</sup> The incidence of oesophagus cancer has decreased considerably in the Northeast of Iran in the past decades<sup>[9,10]</sup> but oesophagogastric cancer is a major problem in the country.<sup>[5,11]</sup> Patients suffer from different overwhelming symptoms, thus assessing the impact of clinical and demographic features of this condition on health-related quality of life (HRQL) in Iranian patients are vitally important.

HRQL is used increasingly as an outcome in different studies such as clinical trials,<sup>[12]</sup> patient's assessment and predicting the survival and prognosis.<sup>[13]</sup> HRQL instruments are ideal for determining the efficacy and impact of cancer care.<sup>[14]</sup> Robust HRQL questionnaires have been developed and validated in the past decades to measure different aspects of quality of life in oesophageal and gastric cancers.<sup>[13]</sup> Measuring HRQL amongst this group of patients may help the health professionals and caregivers to identify the most troublesome symptoms to alleviate patients to face better with the disease.<sup>[14]</sup>

The aim of the present study was to examine whether the clinical and demographic features affect the health-related quality of life in patients with upper GI cancer.

## METHODS

### Patients

A cross-sectional study was conducted in the

Medical Oncology departments of Oncology hospitals in North-East of Iran — University of Medical Sciences, consisting of a consecutive sample of upper-gastrointestinal cancer patients recruited into the study during September 2010 to June 2011. Patients with a histological diagnosis of ADC and SCC of oesophagus, stomach and oesophago-gastric (OG) junction were considered eligible to participate in the study. Patients were excluded if they were unable to understand the language of the questionnaire (Farsi), other previous or concurrent malignancies, and a psychological or linguistic impairment that prohibited completion of the questionnaires. There was no limit on age or performance status.

### Questionnaires and data collection

All participants attended at the outpatient clinic of oncology department completed the EORTC QLQ-C30 (version 3.0),<sup>[15,16]</sup> which had been administered in Iranian patients previously,<sup>[17]</sup> and EORTC QLQ-OG25 which has been translated into Farsi using the EORTC guideline<sup>[18]</sup> specifically for this study. A demographic questionnaire was developed by research team asking about patients' characteristics and also clinic-pathological features from their medical records. For HRQL assessment, patients were asked to self-complete the questionnaires, illiterate patients and those who sought help were assisted by a trained staff and their relatives to fill out the tools.

The QLQ-C30 is a self report multi-dimensional general cancer-specific questionnaire which is made up of 30 items in five function domains and one global HRQL domain; three symptom domains and six single items, all in 4 item Likert style and two questions (global health status) in 7-item option<sup>[15]</sup> where the higher score indicates the higher level of functioning or global QOL. In symptom scales and single items, however, the higher score implies the higher level of symptoms or medical problems.<sup>[19]</sup> The core questionnaire, the EORTC QLQ-C30, is an extensively validated questionnaire with robust validity and reliability in different cancer setting worldwide.<sup>[20-24]</sup> Previously, The QLQ-C30 had been translated, validated and administered in Iran<sup>[17]</sup> with a reliability value of 0.65-0.82 and convergent validity for all multi-item subscales above 0.40 and acceptable discriminate validity. Responses to the core questionnaire and the module were linearly converted into 0-100 scores using standard EORTC guidelines.<sup>[19]</sup>

The QLQ-OG25 is a specific self-report questionnaire designed to assess the HRQL in upper-gastrointestinal cancer. The EORTC QLQ-OG25 contains 25 items with six scales; dysphagia, eating restrictions, reflux, odynophagia, pain and anxiety and ten single items. The time frame of the QLQ-OG25 module is “during the past week”.<sup>[25]</sup> The participants also completed a short questionnaire that recorded the socio-demographic characteristics, including health insurance and their ability to cover the costs of treatments. A member of the research team also recorded clinical and histopathologic data. The questionnaire was administered in face to face interview and was well accepted by the present patient population.

### Ethical considerations

Our research protocol and proposal was approved by the ethical committee of Tehran University of Medical Sciences (TUMS). Patients and relatives were informed about the purpose of the study and written informed consent was obtained from all participants.

### Statistical analysis

The population sample was all patients who were referred to outpatient clinics with upper GI cancer for treatment or follow-up. Questionnaire responses were analyzed to assess the impact of clinical and socio-demographic factors on health-related quality of life. Analysis of variance (ANOVA) and *t*-test were applied to compare between numeric variables and Chi-square for categorical variables. All analyses were undertaken using SPSS for windows version 18 (PASW Statistics 18).

## RESULTS

Overall, 275 patients completed the questionnaires which were included in the final analysis, of whom 55% had oesophageal, 34% stomach and 11% OG junction cancers. Patients' age ranged between 18 to 89 years with mean of 62 years (SD = 11.9). Most of the patients were male (57.8%), while male to female ratio was 1.37 and mainly were inhabitant in Khorasan Razavi province (75.6%) and urban areas (52.7%). Only 73% had TNM staging; among them 3% were

in stage I, 28.4% in stage II, 32.3% stage III and 36.3% in stage IV. Clinical and socio-demographic characteristic of patients are shown in Table 1. At the interview, time since diagnosis ranged from 2 to 396 months (mean = 15.9, SD = 29.6 and median = 6 months).

**Table 1:** Socio-demographic and clinical features

	All (N=275)
Gender (%)	
Male	159 (57.8)
Age	
Mean (range)	62 (18-89)
Marital Status (%)	
Married	227 (82.5)
Single	1 (0.4)
Separate, divorced, widowed	47 (17.1)
Education (%)	
Illiterate	168 (61.1)
Elementary school	77 (28)
More than elementary school	30 (10.9)
Occupation (%)	
Housekeeper	107 (38.9)
Working	105 (38.2)
Retired	22 (8)
Unemployed	41 (14.9)
Tumor type (%)	
SCC	145 (52.7)
Adenocarcinoma	127 (46.2)
Lymphoma	1 (0.4)
Others	2 (0.7)
Tumor site (%)	
Oesophagus	150 (54.6)
Stomach	93 (33.8)
O-G junction	32 (11.6)
Stage of tumor (%)	
Stage-I	6 (3)
Stage-II	57 (28.4)
Stage-III	65 (32.3)
Stage-IV	73 (36.3)
No staging	74 (26.9)
Age group (%)	
Less than 30 years	6 (2.2)
31-45	19 (6.9)
46-60	81 (29.4)
61-70	122 (44.4)
71-80	39 (14.2)
More than 80	8 (2.9)
Residence location (%)	
Urban area	145 (52.7)
Rural area	130 (47.3)

Of the total cases, 40.4% were diagnosed by endoscopic method alone which was verified by histology or cytology, while in 59.6% endoscopic diagnosis was confirmed by surgical resection. The frequency of malignancy by site in male and female, in oesophageal was 45.3% and 54.7%, in stomach was 72% and 28% and in OG Junction was 75% and 25%, respectively. The majority of patients had SCC (52.7%) and ADC (46.2%). The most common type of cancer in oesophagus was SCC (95.3%) and the most frequent site of tumor was the lower third of oesophagus, while ADC was the most common type in stomach (97.8%) and OG junction (93.8%). Patients with stomach or OG junction cancers tended more to present in higher stages ( $P < 0.001$ ); this was equally seen in both genders, although it was less significant in women.

Almost two-third of patients had self care ability and 34.4% were cared by their kids and spouses. Although, nearly all patients were covered by health insurance, only 17.1% had ability to cover health expenditures [Table 2]. Treatment multi-modals for total patients and tumor site and its relationship with stage of tumor are shown in Table 3, which was different statistically ( $P < 0.001$ ) even when adjusted by sex ( $P < 0.05$ ). The relationship between tumor site and self care ability with quality of life scales and single items score in patients with oesophago-gastric cancer are shown in Table 4.

According to tumor site, there was no statistical significant difference in functional and symptom scales and single items of EORTC QLQ-C30, however, in EORTC QLQ-OG25 significant differences were seen in anxiety scale ( $P = 0.01$ ), body image, choking and weight loss ( $P < 0.05$ ). Those who had self care ability had better quality of life scores ( $P < 0.01$ ) except diarrhea and hair loss (not significant). There was no significant difference in quality of life scores by sex except financial difficulties ( $P = 0.003$ ), but regarding residency, differences were seen in more QLQ-OG25 scales.

**Table 2:** Patients' social support

	Total number of patients (n=275)
Caregiver (%)	
Kids and spouse	100 (36.3)
Parents	1 (0.4)
Relatives	4 (1.5)
Patients	170 (61.8)
Self care ability (%)	174 (63.3)
Ability to cover health expenditures (%)	47 (17.1)
Insurance (%)	261 (94.9)
Social support (%)	48 (17.5)
Person who completed the questionnaires (%)	
Patients	33 (12)
Relatives	212 (77.1)
Researcher	30 (10.9)

**Table 3:** Patients treatment types

	All (n=275) (%)	Oesophagus (n=150) (%)	Stomach (n=93) (%)	O-G Junction (n=32) (%)
Type of treatment (%)				
Surgery	4 (1.5)	2 (1.3)	1 (1.1)	1 (3.1)
Radiotherapy	6 (2.2)	6 (4)	0	0
Chemotherapy	25 (9.1)	7 (4.7)	12 (12.9)	6 (18.8)
Surgery and radiotherapy	3 (1.1)	1 (0.7)	2 (2.2)	0
Surgery and chemotherapy	40 (14.5)	10 (6.7)	26 (28)	4 (12.5)
Chemo radiotherapy	71 (25.8)	52 (34.7)	13 (14)	6 (18.8)
Surgery and chemo radiotherapy	126 (45.8)	72 (48)	39 (41.9)	15 (46.9)
Stage of tumor $P < 0.001$				
Stage I and II	63 (31.4)	47 (74.6)	13 (20.6)	3 (4.8)
Stage III	66 (32.8)	32 (48.5)	26 (39.4)	8 (12.1)
Stage IV	72 (35.8)	16 (22.2)	42 (58.3)	14 (19.4)
Total	201 (100)	95 (47.3)	81 (40.3)	25 (12.4)

**Table 4:** Quality of life scores by tumor site and self care ability

	Tumor site			ANOVA	Self care ability		T-test
	Oesophagus	Stomach	OG Junction		Yes N=174	No N=101	
	Mean (SD)	Mean (SD)	Mean (SD)	P value	Mean (SD)	Mean (SD)	P value
QLQ-C30							
PF	59 (24)	56 (27)	57 (22)	0.672	66 (20)	45 (26)	<0.001
RF	65 (26)	59 (29)	62 (27)	0.187	72 (22)	47 (28)	<0.001
EF	72 (21)	68 (22)	70 (18)	0.458	74 (18)	64 (25)	0.001
CF	84 (20)	80 (23)	81 (19)	0.344	86 (17)	75 (25)	<0.001
SF	55 (29)	49 (28)	47 (19)	0.173	59 (24)	39 (30)	<0.001
FA	41 (22)	43 (24)	39 (20)	0.536	34 (18)	54 (25)	<0.001
NV	24 (29)	28 (30)	36 (29)	0.065	21 (26)	36 (33)	<0.001
PA	37 (24)	41 (27)	36 (24)	0.491	30 (21)	53 (25)	<0.001
GQL	54 (24)	51 (28)	53 (25)	0.563	60 (23)	41 (25)	<0.001
DY	21 (25)	19 (24)	16 (24)	0.438	17 (22)	25 (27)	0.010
SL	27 (28)	32 (32)	27 (27)	0.395	23 (26)	39 (33)	<0.001
AP	39 (34)	43 (35)	49 (34)	0.710	33 (33)	53 (33)	<0.001
CO	23 (30)	28 (31)	25 (27)	0.422	20 (25)	34 (35)	<0.001
DI	7 (20)	12 (24)	13 (22)	0.215	7 (20)	13 (25)	0.065
FI	69 (34)	74 (31)	80 (22)	0.145	68 (34)	78 (27)	0.017
QLQ-OG25							
OGDYS	29 (26)	29 (25)	30 (25)	0.939	24 (23)	37 (27)	<0.001
OGEAT	37 (24)	36 (23)	43 (24)	0.334	32 (23)	47 (24)	<0.001
OGREX	31 (28)	34 (29)	35 (31)	0.692	28 (26)	41 (31)	<0.001
OGODYN	31 (27)	30 (28)	29 (29)	0.852	25 (25)	40 (29)	<0.001
OGPD	28 (27)	29 (26)	28 (23)	0.980	24 (22)	36 (29)	0.001
OGANX	40 (32)	52 (30)	50 (34)	0.015	39 (30)	56 (33)	<0.001
OGEO	28 (30)	30 (34)	39 (32)	0.205	22 (27)	43 (34)	<0.001
OGDM	38 (31)	42 (34)	47 (33)	0.299	35 (31)	49 (32)	0.001
OGTA	12 (23)	14 (24)	16 (27)	0.773	10 (21)	18 (27)	0.013
OGBI	22 (27)	30 (34)	33 (28)	0.026	19 (25)	37 (34)	<0.001
OGSV	17 (27)	15 (27)	17 (25)	0.843	12 (23)	25 (31)	<0.001
OGCH	23 (26)	15 (24)	28 (25)	0.020	17 (23)	27 (28)	0.001
OGCO	24 (26)	24 (26)	28 (28)	0.724	21 (23)	31 (30)	0.001
OGSP	15 (24)	15 (26)	20 (24)	0.597	10 (18)	26 (30)	<0.001
OGWL	21 (29)	29 (33)	33 (33)	0.042	20 (28)	34 (34)	0.001
OGHAIR	21 (29)	19 (25)	17 (20)	0.806	19 (24)	22 (30)	0.407

QLQ-C30 functional scales (high score=better function): PF, Physical; RF, Role; EF, Emotional; CF, Cognitive; SF, Social; GOL, Global Health Status/QOL. QLQ-C30 symptoms scales (high score=more problems): FA, Fatigue; NV, Nausea and vomiting; PA, pain. QLQ-OG25 symptom scales and items (high score=more problems): OGDYS, dysphagia; OGEAT, eating restrictions; OGREX, reflux; OGODYN, odynophagia; OGPD, pain and discomfort; OGANX, anxiety; OGEO, Eating with others; OGDM, Dry mouth; OGTA, sense of taste; OGBI, Body image; OGSV, Saliva; OGCH, Choking; OGCO, Cough; OGSP, speech; OGWL, Weight loss; OGHAIR, Hair loss.

There were statistically significant differences in quality of life scores by treatment intent in functional and symptom scales ( $P < 0.001$ ) except cognitive function scale ( $P = 0.136$ ), pain and discomfort scale ( $P = 0.332$ ), that patients in curative treatment intent group had better quality of life.

## DISCUSSION

Of the total 275 cases participated in the study, oesophageal to gastric cancer ratio was about 1.6 compared to 2 in the closest province, Golestan, where the highest rate of oesophageal cancer is seen.<sup>[26]</sup> In the present study, mean age

and male–female ratio were lower than the western countries,<sup>[27,28]</sup> which indicates that morbidity risk of upper gastrointestinal cancer in female is near to male in this sample population. Staging of tumor, frequency distribution shows the lower stage tumor as the same as developing countries.<sup>[29,30]</sup> In this study, most of the patients were male (57.8%) and when adjusted for sex and tumor site, the majority of patients with esophageal cancer were female and in the other sub-site of upper GI cancer males prevailed, while in the previous report all sub-sites were higher in men.<sup>[26]</sup> A higher proportion of patients were from urban areas whilst in Malekzadeh *et al* study the proportion of urban residence in upper GI cancers was 29-45%.<sup>[7,26]</sup> Same as the other study,<sup>[31]</sup> the majority of cancer site in oesophagus was in lower third segment, while in the previous study in Golestan<sup>[8,26]</sup> and Hong Kong<sup>[32]</sup> it was reported mainly in the middle third.

There was no statistically significant difference in functional and symptom scales and single items of EORTC QLQ-C30. However, anxiety scale and a few single items of EORTC QLQ-OG25 such as eating with other, body image, chocking and weight loss, in different tumor sites, which differs from previous reports, where differences in social function scale and three scales of QLQ-OG25 and some of its single items were seen.<sup>[25,33]</sup>

In the present study, sex was not associated with major quality of life functions or symptom scores except financial problems, that the score is higher in men, indicating more financial difficulties in men. In Hagedoorn study, women either cancer patients or as caregivers had impaired quality of life and more psychological distress, while male cancer patients or male partners had impaired role function and quality of life and psychological distress in male patients was as same as female patients and female partners.<sup>[34]</sup>

Statistically significant differences in quality of life scores by different tumor site were seen especially in anxiety scale, body image item, choking and weight loss (all with *P* value < 0.05) which differed from the other study.<sup>[25]</sup> This may indicate that patients suffering from upper GI cancer are prone to a variety of symptoms which warrant appropriate individual-based care provision. Moreover, similar to other studies, there were statistically significant differences in quality of life scores by treatment intent, either oesophageal

cancer patients<sup>[27]</sup> or gastric cancer patients,<sup>[35]</sup> who received curative treatments, had better quality of life in more function and symptom scales and single items at baseline assessments.<sup>[27,29,36]</sup>

Unlike similar studies,<sup>[37]</sup> patients resided in rural areas had better QOL scores especially in EORTC QLQ-OG25 symptom scales and single items, which may enroot in the prevalent type of cancer (adenocarcinoma) and higher stages which are seen in patients resided in urban areas in this study. The main limitation of this study was incomplete staging for all patients; this could be improved in a prospective design, with accurate recording of tumor features both clinical and pathological staging.

In conclusion, the findings of this study show that SCC is predominant type of upper GI cancer in Khorasan provinces near the high risk area in Iran and this type of cancer seems to be distributed among both sex and amongst both urban and rural inhabitants. Likewise, higher frequency of tumor in lower third of esophageal and gastric cardia show epidemiologic shift in upper GI cancer. So, further studies are needed to explore these changes to determine the predisposing risk factors. While there was no significant difference in functional and symptom scales and single items of EORTC QLQ-C30, as the generic HRQL tool in malignancies, the specific health-related quality of life tool (EORTC QLQ-OG25) was able to distinguish most of the symptoms in patients with upper GI cancer. Therefore, it is highly recommended to administer this specific tool as a routine clinical assessment of OG cancer patients' care in various inpatient and outpatient settings.

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## REFERENCES

1. Lambert R, Hainaut P. The multidisciplinary management of gastrointestinal cancer. *Epidemiology of oesophagogastric cancer. Best Pract Res Clin Gastroenterol* 2007;21:921-45.
2. Boyle P, Levin B. *World Cancer Report*. Lyon:

- International Agency for Research on Cancer (IARC), World Health Organization; 2008.
3. Gallo A, Cha C. Updates on esophageal and gastric cancers. *World J Gastroenterol* 2006;12:3237-42.
  4. Sweed MR, Edmonson D, Steven J. Tumor of the Esophagus, Gastroesophageal Junction, and Stomach. *Semin Oncol Nurs* 2009;25:61-75.
  5. Sadjadi A, Nouraie M, Mohagheghi MA, Mousavi-Jarrahi A, Malekzadeh R, Parkin DM. Cancer occurrence in Iran in 2002, an international perspective. *Asian Pac J Cancer Prev* 2005;6:359-63.
  6. Naghavi M. Death in eighteen provinces of Iran: Annual report of Ministry of Health and Medical Education. Tehran: Ministry of Health and Medical Education; 2001.
  7. Malekzadeh R, Derakhshan MH, Malekzadeh Z. Gastric cancer in Iran: Epidemiology and risk factors. *Arch Iran Med* 2009;12:576-83.
  8. Taghavi N, Nasrollahzadeh D, Merat S, Yazdanbod A, Hormazdi M, Sotoudeh M, *et al.* Epidemiology of upper gastrointestinal cancers in Iran: A sub site analysis of 761 cases. *World J Gastroenterol* 2007;13:5367-70.
  9. Islami F, Kamangar F, Aghcheli K, Fahimi S, Semnani S, Taghavi N, *et al.* Epidemiologic features of upper gastrointestinal tract cancers in Northeastern Iran. *Br J Cancer* 2004;90:1402-4.
  10. Mahboubi EO, Aramesh B. Epidemiology of esophageal cancer in Iran, with special reference to nutritional and cultural aspects. *Prev Med* 1980;9:613-21.
  11. Mohagheghi MA, Mosavi-Jarrahi A, Malekzadeh R, Parkin M. Cancer incidence in Tehran metropolis: The first report from the Tehran Population-based Cancer Registry, 1998-2001. *Arch Iran Med* 2009;12:15-23.
  12. Sharma D. Health-related quality of life and its assessment in GI Surgery. *Indian J Surg* 2004;66:323-35.
  13. Tamburini M. Health-related quality of life measures in cancer. *Ann Oncol* 2001;12 Suppl 3:S7-10.
  14. Conroy T, Marchal F, Blazeby JM. Quality of life in patients with oesophageal and gastric cancer: An overview. *Oncology* 2007;70:391-402.
  15. Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, *et al.* The European Organization for Research and Treatment of Cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst* 1993;85:365-76.
  16. Fayers P, Bottomley A. Quality of life research within the EORTC-the EORTC QLQ-C30. European Organisation for Research and Treatment of Cancer. *Eur J Cancer* 2002;38 Suppl 4:S125-33.
  17. Montazeri A, Harirchi I, Vahdani M, Khaleghi F, Jarvandi S, Ebrahimi M, *et al.* The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30): Translation and validation study of the Iranian version. *Support Care Cancer* 1999;7:400-6.
  18. Koller M, Aaronson NK, Blazeby J, Bottomley A, Dewolf L, Fayers P, *et al.* Translation procedures for standardised quality of life questionnaires: The European Organisation for Research and Treatment of Cancer (EORTC) approach. *Eur J Cancer* 2007;43:1810-20.
  19. Fayers PM, Aaronson NK, Bjordal K, Groenvold M, Curran D, Bottomley A, *et al.* EORTC QLQ-C30 Scoring Manual. 3<sup>rd</sup> ed. Brussels: European Organisation for Research and Treatment of Cancer; 2001.
  20. Silpakit C, Sirilertrakul S, Jirajarus M, Sirisinha T, Sirachainan E, Ratanatharathorn V. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30): Validation study of the Thai version. *Qual Life Res* 2006;15:167-72.
  21. Zhao H, Kanda K. Translation and validation of the standard Chinese version of the EORTC QLQ-C30. *Qual Life Res* 2000;9:129-37.
  22. Chie WC, Yang CH, Hsu C, Yang PC. Quality of life of lung cancer patients: Validation of the Taiwan Chinese version of the EORTC QLQ-C30 and QLQ-LC13. *Qual Life Res* 2004;13:257-62.
  23. Hoopman R, Muller MJ, Terwee CB, Aaronson NK. Translation and validation of the EORTC QLQ-C30 for use among Turkish and Moroccan ethnic minority cancer patients in the Netherlands. *Eur J Cancer* 2006;42:1839-47.
  24. McLachlan SA, Devins GM, Goodwin PJ. Validation of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (QLQ-C30) as a measure of psychosocial function in breast cancer patients. *Eur J Cancer* 1998;34:510-7.
  25. Lagergren P, Fayers P, Conroy T, Stein HJ, Sezer O, Hardwick R, *et al.* Clinical and psychometric validation of a questionnaire module, the EORTC QLQ-OG25, to assess health-related quality of life in patients with cancer of the oesophagus, the oesophago-gastric junction and the stomach. *Eur J Cancer* 2007;43:2066-73.
  26. Islami F, Kamangar F, Aghcheli K, Fahimi S, Semnani S, Taghavi N, *et al.* Epidemiologic features of upper gastrointestinal tract cancer in Northeastern Iran. *Br J Cancer* 2004;90:1402-6.
  27. Blazeby JM, Conroy T, Hammerlid E, Fayers P, Sezer O, Koller M, *et al.* Clinical and psychometric validation of an EORTC questionnaire module, the EORTC QLQ-OES18, to assess quality of life in patients with oesophageal cancer. *Eur J Cancer* 2003;39:1384-94.
  28. Blazeby JM, Metcalfe C, Nicklin J, Barham CP, Donovan J, Alderson D. Association between quality of life scores and short-term outcome after surgery for cancer of the oesophagus or gastric cardia. *Br J Surg* 2005;92:1502-7.

29. Onate-Ocana LF, Alcantara-Pilar A, Vilar-Compte D, Garcia-Hubard G, Rojas-Castillo E, Alvarado-Aguilar S, *et al*. Validation of the Mexican Spanish version of the EORTC C30 and STO22 questionnaires for the evaluation of health-related quality of life in patients with gastric cancer. *Ann Surg Oncol* 2009;16:88-95.
30. Huang CC, Lien HH, Sung YC, Liu HT, Chie WC. Quality of life of patients with gastric cancer in Taiwan: Validation and clinical application of the Taiwan Chinese version of the EORTC QLQ-C30 and EORTC QLQ-STO22. *Psychooncology* 2007;16:945-9.
31. Bafandeh Y, Hashemzadeh S, Sokouti M, Esmaili H. Clinicopathologic characteristics of esophageal cancer patients in northwest Iran—very low incidence of adenocarcinomas. *Asian Pac J Cancer Prev* 2006; 7:480-2.
32. Branicki FJ, Law SY, Fok M, Poon RT, Chu KM, Wong J. Quality of life in patients with cancer of the esophagus and gastric cardia: A case for palliative resection. *Arch Surg* 1998;133:316-22.
33. McKernan M, McMillan DC, Anderson JR, Angerson WJ, Stuart RC. The relationship between quality of life (EORTC QLQ-C30) and survival in patients with gastro-oesophageal cancer. *Br J Cancer* 2008;98:888-93.
34. Hagedoorn M, Buunk BP, Kuijjer RG, Wobbes T, Sanderman R. Couples dealing with cancer: Role and gender differences regarding psychological distress and quality of life. *Psychooncology* 2000;9:232-42.
35. Montazeri A, Sadighi S, Sedighi Z, Mohagheghi MA, Froutan H. Quality of life in patients with gastric cancer: Translation and psychometric evaluation of the Iranian version of the EORTC QLQ-STO22. *BMC Cancer* 2009;9:305.
36. Blazeby JM, Conroy T, Bottomley A, Vickery C, Arraras J, Sezer O, *et al*. Clinical and psychometric validation of a questionnaire module, the EORTC QLQ-STO 22, to assess quality of life in patients with gastric cancer. *Eur J Cancer* 2004;40:2260-8.
37. Tian J, Chen ZC, Wu B, Meng X. Comparison of quality of life between urban and rural gastric cancer patients and analysis of influencing factors. *World J Gastroenterol* 2004;10:2940-3.

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