Food insecurity and some associated socioeconomic factors among upper gastrointestinal cancer patients

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ABSTRACT: Food insecurity is defined as the limited or uncertain availability of enough food for an always active and healthy life. Cancer as debilitating and lifespan reductive disease causes many individual and social damages. The aim of this study was assessing food insecurity status and some associated socioeconomic factors in patients with upper gastrointestinal cancers. A cross-sectional study on 120 patients (72 males and 48 females with mean age 62.23 years) with upper gastrointestinal cancers including stomach and esophagus cancers hospitalized in the cancer institute of Iran in 2012. General and socioeconomic characteristics and food insecurity status assessed using socioeconomic and 18-item USDA household food security questionnaires. SPSS16.0 and Stata11SE software were used for Statistical analyses. Percentage of food insecurity was 69.17%. Food insecurity was significantly associated to having children under 18 years of age and low economic level. Since food insecurity in patients with esophagus and stomach cancers is more prevalent than others, it is essential to pay more attention for reduction of food insecurity in the society.

Keywords: Food insecurity, Upper gastrointestinal cancers, Tehran, Iran

INTRODUCTION

Food insecurity is defined as limited or uncertain access nutritionally to adequate and safe food or limited or uncertain ability to gain acceptable foods in socially acceptable ways. Although food insecurity and hungry is regularly result of limited financial resources, poverty and income measurement do not provide us with applicable information about household food security status. Studies have shown that many low income households are food secure and few non-poor households are food insecure (Bickel et al, 2000; Hakim et al, 2011). Food insecurity includes concern about food in household level to hungry in children level (Keenan et al, 2001). In different studies about food insecurity, have been shown that age, household head educations, economic status, job losing, lack of stable job and saving, single head, ethnic/race, enhancing of household dimension, and losing of food aid are effective risk factors (Campbell, 1991; Hamilton et al, 1997; Radimer et al, 1990; Radimer et al, 1992). Direct and indirect methods have been used to evaluate household food security in Iran (Djazayeri et al, 1999; Ghassemi et al, 1996; Hakim et al, 2011; SCI, 2008; Zerafati-Shoa et al, 2007). Only one cross-sectional study in Kentucky has directly measured food insecurity status among cancer patients using 6-item USDA household food security questionnaire (Simmons et al, 2006). Previous studies have indicated that food insecurity associated with many
physical and mental diseases and likely is correlated with cancer. In addition, esophagus and gastric cancers are among five common cancers in Iran (Kolahdoozan et al, 2010). Food insecurity status has not been assessed with direct or indirect methods among particularly cancer patients in Iran. This study was designed to assess food insecurity status and some of associated socioeconomic factors among newly diagnosed patients with upper gastrointestinal (including esophagus and stomach) cancers.

METHODS AND SUBJECTS

This cross-sectional study was conducted on 120 upper GI (gastric, esophagus, both) cancer patients, which had been newly diagnosed and were hospitalized at the cancer institute of Cancer Research Center, Imam Khomeini hospital complex of Tehran in 2012. General and socioeconomic characteristics including age, sex, marital status, employment status, education, home ownership, number of household items (economic level), household dimension, number of children, number of household employed people, having children under 18 years, supported by any organizations, type of insurance, food assistance, prescribed by any treatments in previous 6 months, peptic ulcer and other diseases history, family history of cancer and smoking and food security status were assessed using 31-item general and socioeconomic characteristics and 18-item USDA household food security questionnaires, respectively. It should be mentioned that 18-item USDA household food security questionnaire has been validated in Iran (Hakim et al, 2011; Mohammadzadeh et al, 2010; Ramesh et al, 2010). To begin, a pilot study was performed on 19 newly diagnosed cancer patients to determine requirements in research environment, how patients respond to the questionnaires, changes needed to general and socioeconomic questionnaires and determining number of subjects. By perusing documents in surgery and central sections of cancer institute of Iran, profile of patients and their related information were exploited and they were selected as suitable subjects according to entry criteria including gastric and esophagus cancers or both, having diagnosed in less than six months, and age of more than 20 years of old. Also, excluding criteria included in age of less than 20 years of old, having extreme enough disability to be able to response, psychosis mental disease, disease leading to no reminder (for example, Alzheimer’s) and lack of cooperation by the end of inquiry. Then the questioner gone to patient bedside and after description of study and obtaining informed consent, interviewed to complete general and socioeconomic characteristics and food security status questionnaires, respectively. Only 4 patients did not consent to enroll to study that were replaced with the next patients. Ethical considerations were considered as for the confidentiality of data and lack of any interventions. Economic level in general and socioeconomic questionnaire was measured by 9-items of household that were classified less of 3-item as poor economic level, 4 to 6-item as moderate economic level, and more of 7-item as wealthy economic level. Rating of 18-item USDA household food security status questionnaire is that is given positive rate to answers “often true”, “sometimes true”, “almost every month”, “some months”, and “yes” and zero score to responses “not true”, “does not know or refused”, “only 1 or 2 months” and “no”. Finally, scores 0-2 in food secure group, 3-7 in food insecure group without hunger, 8-12 in food insecure group with moderate hunger, and 13 and higher in food insecure group with severe hunger are situated. Data were analyzed using of SPSS16.0 and Stata11SE statistical software. Food security status was considered as food secure and food insecure groups. To assess the relationship between qualitative variables and food insecurity and quantitative variables with food security score were used chi-square and Mann-Whitney and Pearson correlation coefficient tests, respectively. At end variables associated with food insecurity and food insecurity the forward were entered into the multiple logistics regression final model to identify independent risk factors for food insecurity. Significant p-value was less than 0.05.

RESULTS

Patients included 72 males and 48 females with mean of age 60.23 years. Seventy nine patients have gastric cancer (55 males and 24 females), 30 patients esophagus cancer (10 males and 20 females), and 11 patients both the gastric and esophagus cancers. Most patients were non-employees (n=115), have with insurance (n=114), married (n=110), with no peptic ulcer history (n=100), non-fars (n=98), the low economic level (n=96), with no children under 18 years (n=95), with ownership of home (n=91), with no support of organizations (n=88), with history of drug intake at 6 months (n=87), with no smoking (n=85), with no disease history other than cancer (n=78), family history of cancer (n=76) and about half were found with primary educations or higher (n=59) and normal body mass index (n=62) (Tables 1 and 2).
Table 1. Qualitative variables associated with food insecurity in newly diagnosed patients with upper gastrointestinal cancers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Food secure (n=37)</th>
<th>Food insecure (n=83)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Economic levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealthy &amp; Moderate</td>
<td>12</td>
<td>50%</td>
<td>12</td>
</tr>
<tr>
<td>Poor</td>
<td>25</td>
<td>74%</td>
<td>71</td>
</tr>
<tr>
<td>Children under 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>16%</td>
<td>21</td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>34.7%</td>
<td>62</td>
</tr>
<tr>
<td>family history of cancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>20.5%</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>36.8%</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 2. Linear regression between score of food security and quantitative variable in newly diagnosed patients with upper gastrointestinal cancers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Score of food security</th>
<th>Pearson coefficient</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers of household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>employed peoples</td>
<td>120</td>
<td>-0.26</td>
<td>0.004</td>
</tr>
</tbody>
</table>

The percentage of food insecurity was 69.17% that 29.17% food insecurity without hunger, 31.7% food insecurity with moderate hunger, and 8.3% food insecurity with severe hunger. Variables associated with food insecurity and food insecurity were entered into the multiple logistics regression final model and the only having children under 18 years and low economic levels were independently and directly associated with food insecurity (Table 3).

Table 3. Logistics regression final model of the factors affecting food insecurity in newly diagnosed patients with upper gastrointestinal cancers.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>OR (CI 95%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealthy &amp; Moderate</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>3.37 (1.27-8.9)</td>
<td>0.014</td>
</tr>
<tr>
<td>Children under 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3.43 (1.02-11.45)</td>
<td>0.045</td>
</tr>
</tbody>
</table>

**DISCUSSION**

In this study that has been conducted in newly diagnosed patients with upper GI cancers (esophagus and gastric or both), percentage of food insecurity, without hunger, with moderate hunger, and with severe hunger were 69.17%, 29.17%, 31.7%, and 8.3%, respectively. In contrast, Kentucky study that was conducted among cancer patients (different type of cancer), percentage of food insecurity, without and with hunger were 17.4%, 9.6%, and 7.8%, respectively. As previously mentioned, this study has been the first study on food security in cancer patients among Iranian population while other conducted studies were performed over the entire population (including both normal or cancer subjects), so that average percentage of food insecurity have been reported about 45% (Dastgiri et al, 2006; Djazayeri et al, 1999; Hakim et al, 2011; Karamsoltani et al, 2007; Mohammadpour Koldeh et al, 2011; Mohammadzadeh et al, 2010; Najafi et al, 2005; Payab et al, 2012; Ramesh et al, 2010) that compared with present study are significantly lower.

In Kentucky study was significant relationship between food insecurity and education level, employment status, household annual income, and insurance status, whereas in this study food insecurity was significantly associated with having children under 18 years of old and the poor economic levels that probably due to differences in sampling and the type of cancers is different. Since the any studies have been performed on the socioeconomic factors and food insecurity association among cancer patients in Iran, therefore the results can’t be compared with other patients and inevitably, the results of this study with the results of other conducted studies in the Iranian population have been compared.

In contrast, in different studies in Shiraz, Isfahan, Qaresoo region of Khoy, Tabriz, Yazd and Rey furthermore food insecurity was significantly associated with more numbers of children, household dimension, job status, education level and ownership of home (Dastgiri et al, 2006; Karamsoltani et al, 2007; Mohammadzadeh et al, 2010; Payab et al, 2012; Ramesh et al, 2010; Sharafkhani et al, 2010).

In previous studies of Iran it has been found food insecure peoples have a lower economic level (Dastgiri et al, 2006; Ghassemi et al, 1996). Also in other studies food insecurity had a significant inverse relationship with the economic level (Nord et al, 2011; Bengle et al, 2010; Chimeddulam et al, 2008; Willows et al, 2009). Food security is an important determinant of economic levels and a critical factor of access to food in society. Households with higher incomes and a better economic status have more choice in their food and more percentage of income spent
to food (Rose et al. 1998). In addition, part of the food security questionnaire is completed if households have been children under 18 years. So, economic levels and having children under 18 years can affect all aspects of the food security status, especially in patients with upper gastrointestinal cancers. Due to the lack of previous studies related to socioeconomic factors and food security status in newly diagnosed patients with upper GI cancers, more accurate comparisons need to further studies.

Direct assessment of food insecurity status and some of associated factors in cancer patients was performed first time in Iran that is strong point of this study.

**CONCLUSION**

Food insecurity status in particularly cancer patients has not studied in Iran previously to discuss about factors affecting on food insecurity among particularly patients with esophagus and stomach cancers but according to more percentage of food insecurity in patients with esophagus and stomach cancers comparing with percentage of food insecurity in different studies of Iran, it can be said likely a more percentage of food insecurity accompany with a more incidence of gastric and esophagus cancers and also percentage of these cancers may be reduced by reducing the food insecurity. So that this study was cross-sectional, to prove socioeconomic factors and food insecurity are needed case-control or cohort studies.

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**REFERENCES**


