Is Food Security Associated to Nutritional Status among Hospitalized Cancer and non-Cancer Patients?

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ABSTRACT: Food and nutrition are included in basic needs of humans, and their providing lies in food security term. Food insecurity has effect on individual nutritional status. In addition, appropriate nutrition status of hospitalized patients, would help preventing the complications of various treatments. Since no studies have checked the association of food security and nutritional status in hospitalized (specifically cancerous) patients, therefore this study aimed to assess the relationship between food security and nutritional status in cancer and non-cancerous patients. This cross-sectional study conducted in 1390 on 240 (cancer and non-cancerous) patients from cancer institute, orthopedics, neurology and ENT (ear-nose and throat) sections of Imam Khomeini Hospital of Tehran. General characteristics, nutritional status and food security status were assessed using general, PG-SGA and USDA household food security questionnaires, respectively. Data were analyzed using chi-square and Pearson correlation coefficients tests and statistical software SPSS16.0. Percentage of moderate malnutrition (or suspected of malnutrition) and severe malnutrition were 41.7%, and 25.8%, respectively. Chi-square and Pearson correlation coefficients tests results indicated that food insecurity was significantly associated to nutritional status, so that with increasing food security score, SGA score increased (P<0.05). Because the Percentage of malnutrition in food insecure patients was more than of food secure patients, by reducing food insecurity the nutritional status of hospitalized cancer and non-cancer patients in will probably improve.

Keywords: Nutritional Status, Food Security, Hospitalized Patients, Iran

INTRODUCTION

Nutrition is one of the basic needs of human society, and meeting this need depends on establishing and maintaining food security: access to sufficient food for all people at all times, and the availability of nutritionally adequate and safe food that is socially acceptable (LSRO, 1990; Kendall et al, 1995; Dastgiri et al, 2006). Once, diet was not thought to play any role in diseases and related deaths, but researchers have proven that diet plays an important role in the incidence, prevention and treatment of various diseases. Because humans must eat food every day, and due to the number and variety of diseases that are potentially associated with diet, nutrition has an important role in helping people heal faster and reducing the duration of hospitalizations. Numerous studies have shown that factors such as age, education, the economy, job loss, lack of stable jobs and savings, single-headed household, ethnicity, large family size and the loss of food aid affect food security (Campbell, 1991; Hamilton et al, 1997; Radimer, 1990; Radimer, 1992). Indirect and Direct methods have been used to assess food security in Iran (Djazayeri et al, 1999; Ghassemi et al, 1996; SCI, 2006; Hakim et al, 2011; Zerafati-Shoa et al, 2007). However, few studies have examined food security in hospitalized patients; there is only one relevant study of cancer patients (Simmons et al, 2006) and only two studies (Evaluation of nutritional status with the PG-SGA questionnaire) conducted on cancer patients in Iran (Zarif-Yeganeh et al, 2010; Gholami et al, 2006). Moreover, there is no documentation on food security for non-cancer patients admitted to hospitals.
Previous studies have indicated that food security—and thus, either directly or indirectly, nutritional status—is associated with socio-economic factors. Since the food security situation in Iran, particularly in cancer and non-cancer hospitalized patients, has not been studied, this study was designed to investigate the relationship between food security and nutritional status in hospitalized cancer and non-cancer patients.

METHODS AND SUBJECTS

A cross-sectional study was conducted on 240 patients with newly diagnosed disease from the orthopedic, neurosurgical and ear, nose and throat departments of Imam Khomeini Hospital, Tehran. The patients' general health, nutrition and food-security situation were examined using the 18-item General, PG-SGA and household food security status USDA questionnaire. It should be noted that in previous studies the use of PG-SGA of nutritional status (Zarif-Yeganeh et al, 2010; Gholami et al, 2006; Mahdavi et al, 2007; Khoshnevis et al, 2012) and food security questionnaires (Hakim et al, 2011; Mohammadzadeh et al, 2010; Ramesh et al, 2010) has been validated.

Before the main study, a pilot test was conducted on 19 newly diagnosed cancer patients and 21 cancer-free patients. The neurology, domestic, ear, nose and throat and orthopedic departments provided us with patient's names and medical records for review. According to the entry criteria—having one of several specific disorders (upper gastrointestinal cancer, neurology disorder, non-fracture orthopedic or ear, nose and throat disease), diagnosed less than six months before the study and aged more than 20 years—patients were enrolled. Patients completed an informed-consent form. It should be noted that given that cancers of the upper digestive tract (stomach and esophagus) in one of five common cancers, cancer patients were selected from this group (Kolahdoozan et al, 2010).

Patients were excluded if they were aged less than 20 years, had a disability severe enough to not be able to answer, psychosis, mental illness, multiple sclerosis, diseases resulting in a lack of memory (Alzheimer's or schizophrenia) or non-cooperation.

Rating Questionnaire 18-item food security situation USDA is as follows:

The 18-item questionnaire asked respondents to rate each item from zero to two points (for example, when a respondent rated whether a statement was true for them, a response of "not true" would score no points, "sometimes true" would score one point and "often true" would score two points). In general, a total score of 0 to 2 indicates that the respondent has food security; 3 to 7 indicates food insecurity without hunger; 8 to 12 indicates food insecurity with moderate hunger; and 13 or higher indicates food insecurity with severe hunger. In this study, the respondents were divided into two groups food-secure and food-insecure.

A number of criteria were used to classify patients' nutritional status: recent weight gain or loss (no fluids); level of nutrients, including recent significant boost; performance; recent improvement or deterioration in symptoms; and physical defects. A patient in good condition would have weight gain or no weight loss; no shortage of nutrients or recently received a significant boost; no failure or a recent significant increase in performance; no deterioration or significant recent improvement in symptoms; and no physical defect in a recent physical examination. A patient would potentially have moderate or suspected malnutrition if they exhibited a 5% weight loss in one month (10% in six months) and continued weight loss or weight instability; a marked reduction in nutrient intake; symptoms such as anorexia, nausea, vomiting, constipation, diarrhea or dry mouth; moderate impairment of, or recent deterioration in functioning; and evidence of loss of fat stores or muscle mass or tone in a state of muscle contraction. A patient would potentially have severe malnutrition if they exhibited more than 5% weight loss within one month (more than 10% in six months); unstable weight or sustained weight loss; severe lack of nutrients; signs of feeding; severe impairment of or significant deterioration in recent performance; and obvious signs of severe malnutrition, such as loss of fat tissue or edema.

The questionnaire also identifies the potential need for triage and advice regarding specific nutritional interventions, including patient and family education, symptom management (including pharmacological intervention) and appropriate nutritional intervention (food, nutritional supplements, enteral or parenteral nutrition triage).

Nutritional interventions, including management of symptoms, are the first step. Patients rated 0 to 1 do not need any intervention, although re-evaluation should be performed routinely and regularly during treatment. Patients rated 2 to 3 should, along with their families, receive instruction from a dietitian, nurse or other health professional, and pharmacological interventions as appropriate to their symptoms. Patients rated 4 to 8 are considered to be in need of intervention from a dietitian, nurse, or doctor about nutrition as identified by review of signs and symptoms. Patients scoring 9 or greater are in critical need of symptom management or nutrient intervention (Bauer et al, 2002).

The statistical tests chi-square and Pearson's correlation coefficient were used to evaluate the relationship between malnutrition and food security, and between nutritional status and food-security scores. The statistical software SPSS16.0 was used for data analysis, and a significance level of less than 0.05 was acceptable.
RESULTS

One hundred forty-four male and 96 female patients with an average age of 60.32 ± 11.71 years participated in the study. These included 120 cases of upper gastrointestinal cancer (72 men and 48 women), 31 patients with panic disorder (13 males and 20 females), 51 orthopedic patients (35 males and 16 females) and 36 patients with diseases of the ear, throat and nose (24 males and 12 females).

The percentage of patients with food insecurity was 56.3%; with moderate malnutrition (or suspected malnutrition) 41.7%; and severe malnutrition 25.8%. Pearson and chi-square tests results showed that food insecurity had a significant positive association with nutritional status: an increase in food-security rating was correlated with an increase in nutritional status.

Table 1: Food security and nutritional status of hospitalized cancer and non-cancer patients

<table>
<thead>
<tr>
<th>Factors</th>
<th>Nutritional Status</th>
<th>P-Value (χ²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well Nourished</td>
<td>Moderate Malnutrition</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Food Security</td>
<td>Food Secure</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Food Insecure</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 2: Linear regression between food security scores and PG-SGA questionnaire scores

<table>
<thead>
<tr>
<th>Factors</th>
<th>PG-SGA Questionnaire Scores</th>
<th>P-Value</th>
<th>Pearson Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Security</td>
<td>n</td>
<td>0.378</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

DISCUSSION

In the present study, nutritional status was significantly associated with food security: increases in food insecurity indicated increased likelihood of malnutrition in hospitalized patients. The incidence of malnutrition (moderate and severe) was 67.5%, and the incidence of food insecurity was 56.3%. In another study on cancer patients, malnutrition scores were significantly higher in the group of food-insecure patients, consistent with the relationship found in this study (Simmons et al, 2006). Gholami and colleagues studied the early stages of malnutrition in hospitalized patients with gastrointestinal cancer, finding that 70.6% could be classified as malnourished, and demonstrated the importance of early diagnosis of malnutrition in hospitalized patients (Gholami et al, 2006). Another study showed that 80% of patients were malnourished and in need of nutritional intervention (Zarif-Yeganeh et al, 2010), which was significantly higher than the results in this study; this may be because that study was performed only on patients with cancer. The average percentage of food insecurity in the community (for people both healthy and sick) is about 45% (Daneshi Maskooni et al, 2012), lower than that found in the present study. Studies have shown that people at lower economic levels have greater food insecurity (Dastgiri et al, 2006; Ghassemi et al, 1996). Food insecurity in other studies outside Iran have also had a significant reverse relationship with the level of economic (Nord et al, 2010; Bengle et al, 2010; Chimeddulam et al, 2008; Willows et al, 2009).

A critical factor in food security is the availability of food in the community. Households with higher incomes and better economic conditions have more choice in food and more discretionary income to spend on food (Rose et al, 1998).

By the same token, the nutritional status of hospitalized patients can be particularly affected by food insecurity. While a few previous studies have documented the relationship between nutritional status and food security (as discussed above), further studies are needed to examine this relationship more deeply.

CONCLUSION

The significant association between level of malnutrition and food insecurity suggests that improving food security and nutritional status in hospitalized patients may reduce the severity of their symptoms and improve discharge time. However, due to the cross-sectional nature of the current study, the exact cause-and-effect relationship between these factors cannot be determined. Further study of each of the patient groups, or of individual patients, to further clarify the relationship is recommended.

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