

Epidemiology of Food Insecurity in the North West of Iran

¹S. Hoseinikhorrani, ²S. Dastgiri, ¹F. Bakhtari and ¹H. Tutunchi

¹School of Public Health and Nutrition, Tabriz University of Medical Sciences, Tabriz, Iran

²Department of Community and Family Medicine, School of Medicine,
National Public Health Management Centre, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract: Food security is defined as access by all people at all times to enough food for an active, healthy life. Food insecurity and hunger not only affect physical health, but also have social and psychological consequences. The aim of this study, was to represents the prevalence of food insecurity in the northwest region of Iran. This cross-sectional study was carried out on 405 family selected randomly in Marand area of the northwest of Iran to determine families who live in rural and urban areas where access to food supplies whether influenced by economical status or nutritional knowledge. The survey instrument included 3 questionnaire about the frequency of 50 food items consumption, 24 h food recall questionnaire for 3 days of a week, food availability, economical status and nutritional attitude. The intake of all micronutrients in men were significantly higher than in women. Also the intake of macronutrients in rural areas were significantly higher than in urban areas. The percent of total calorie intake was concentrated on fat and protein more than on carbohydrate. Vitamin A, folate, vit C and selenium intakes were lower in rural areas. The prevalence of severe and moderate food insecurity were not noticeable (8, 7%, respectively) but the prevalence of high intake was more than 50% of the total society (52%). The rate of nutritional knowledge in urban was higher than in rural area (4.9vs 2.8%). Also the nutritional attitude of this families was at the low level (67.4% of the urban families vs 84.5% of the rural families). Our findings indicated that food insecurity was prevalent in the northwest of Iran and our view of the food security challenge facing governments is, the promotion of free trade in the region, improvement in infrastructure, optimally placed to promote trade and coordination of government actions to develop futures and options markets.

Key words: Epidemiology, food insecurity, survey instrument, micronutrients, psychological and social consequences

INTRODUCTION

Food security is defined as access by all people at all times to enough food for an active, healthy life and at a minimum includes the following: The ready availability of nutritionally adequate and safe foods and the assured ability to acquire personally acceptable foods in a socially acceptable way (LSRO, 1990). Food insecurity and hunger not only affect physical health, but also have social and psychological consequences (Hamelin *et al.*, 2002; Derrickson *et al.*, 2001; Lee and Frongillo, 2001; Tarasuk, 2001). Therefore, a simple and valid method is necessary for surveillance of food security and fight against food insecurity in society (Shane *et al.*, 2000; Hargrove *et al.*, 1994; Hamelin *et al.*, 1999; Oldewage-Theron *et al.*, 2005). Food and nutrition are now regarded as being of fundamental importance to public health in both

developed and developing countries (Campbell, 1991). The public health approach to the prevention of malnutrition and diet-related disease requires the adoption of health-oriented nutrition and food policies for the whole nation (Davis and Tarasuk, 1994; Rose *et al.*, 1995). This can only happen if enough information regarding food composition and nutrition is available. The dietary pattern differs from individual differences, geographic area, food habits and nutritional knowledge (Maxwell, 1996).

MATERIALS AND METHODS

This cross-sectional study was conducted in Marand of the northwest of Iran. This study represents one part of a larger effort to determine the most effective food security monitoring tool.

The population under study included 110 rural and 4 urban areas in and around Marand city that consist of 96396 individuals from 47801 families, which we selected 405 family, randomly. Information on food availability, economical status and nutritional knowledge that obtained from this study was designed to increase understanding of the experience of food insecurity in order to contribute to its prevention. This study was carried out to determine families who live in rural and urban areas where access to food supplies whether influenced by economical status or nutritional knowledge. At the level of aims, there are examples of practical anti-poverty strategies and nutritional attitudes. The survey instrument included the following:

- The questionnaire about the frequency of 50 food items consumption and using 24 h food recall questionnaire for 3 days of a week (one holiday and 2 days at the middle of week).
- The questionnaire for assess the food availability and economical status.
- The questionnaire of nutritional attitude that evaluate the knowledge of the individuals about supply and maintenance of food.

RESULTS

Vitamin, mineral and macronutrients were assessed in this study. The intake of all micronutrients in men were significantly higher than in women. Also the intake of macronutrients in rural areas were significantly higher than in urban areas. The percent of total calorie intake were concentrated on fat and protein more than on carbohydrate.

Vitamin A, folate, vit C and selenium intakes were lower in rural areas. Table 1 and 2 shows this information.

Compared to mean requirements, intakes of nutrients and calorie were clearly high. Although in this study there wasn't any problem for food availability but we observed several disorders in dietary patterns that it can be referred to the role of food selection.

According to the information of this survey, the prevalence of severe and moderate food insecurity were not noticeable (8 and 7%, respectively) but the prevalence of high intake was more than 50% of the total society (52%).

Our findings show some information about nutritional knowledge, practice and attitude in this

Table 1: Daily micro and macronutrients intake (mean±SD) by rural and urban distribution

Nutrient	$\bar{X} \pm SD$ urban	$\bar{X} \pm SD$ rural	P.V
Calorie	1869.330±735.103	1977.071±724.711	0.00192
Protein	52.394±146.621	56.055±39.543	0.01429
Carbohydrate	311.315±146.264	335.306±145.171	0.0005
Carotene	417.551±572.515	261.844±1398.521	0.000000
Vit a	532.857±699.227	390.369±542.868	0.000002
Tiamin	1.378±0.627	1.519±0.773	0.000021
Niacin	17.307±8.434	18.823±10.308	0.000636
Folate	97.714±64.341	92.373±50.164	0.0545
Vit c	56.251±53.729	47.464±39.461	0.000116
Calcium	447.599±242.169	510.884±353.006	0.000008
Iron	19.123±9.473	21.487±10.815	0.000001
Potassium	1572.172±795.689	1480.483±707.918	0.00938
Selenium	31.598±18.091	27.535±16.530	0.000001
Sodium	1820.271±1131.189	1699.150±980.448	0.01699
Cal/pro	11.197±2.307	10.921±2.623	0.0236
Cal/cho	64.436±10.269	65.749±11.634	0.011
Cal/fat	24.33±10.305	23.195±11.225	0.0262

Table 2: Daily micro and macronutrients intake (mean±SD) by sex group

Nutrients	$\bar{X} \pm SD$ women	$\bar{X} \pm SD$ men	P.V
Calorie	1845±714.965	1992±742.210	0.000020
Protein	50.839±21.961	57.312±38.591	0.000013
Carbohydrate	307.181±141.184	333.377±147.802	0.000130
Lipid	50.150±38.157	51.877±29.543	0.28
Cholestrole	102.120±106.112	110.149±113.034	0.1212
Tiamin	1.363±0.669	1.506±0.721	0.000013
Niacin	16.962±8.890	18.012±9.663	0.000009
Calcium	453.386±280.018	489.152±304.693	0.0097
Iron	19.021±9.673	21.155±10.465	0.000008
Sodium	1713.363±1021.017	1821.554±1102.180	0.031
Cal/pro	10.93±2.67	11.191±2.381	0.03

population. The findings showed that the nutritional knowledge of any families was not at the very high level and only 4% of the families were at the high level.

The rate of nutritional knowledge in urban was higher than in rural area (4.9 vs 2.8%).

The nutritional attitude of any families was not very high or high and more than 90% of them were at the low level. Also the nutritional attitude of this families was at the low level (67.4% of the urban families vs 84.5% of the rural families).

DISCUSSION

It is necessary to supply food that is safe and of good quality to everyone. To reach this goal, it is essential to know the nutrient composition of foods available, even though much of this information is still to be generated and compiled. The information on the nutrient composition of food will be used for nutritional assessment, planning and implementation of food and nutrition education programs as well as research, food labeling, consumer information, product development, food trade and export (Van and Schonfeldt, 2004).

It must be emphasized that the magnitude and complexity of nutritional problems facing mankind today demand a multidisciplinary and geographically appropriate solution (Joda *et al.*, 2001).

The goal of reducing the percentage of food insecure populations can be accomplished under certain circumstances. Our proposed scenarios for further reducing the food insecurity by stimulating either agricultural trend growth, labor productivity growth, economical trend growth led to improved food insecurity outcomes.

The framework for government food security actions are included following:

- At the national and regional levels-ensuring food availability through production, trade and food aid-which affect food prices.
- At the household level-access to and acquisition of food, determined by income and prices (Anderson *et al.*, 2005; Shane *et al.*, 2000).
- At the individual level-food use, affected by nutritional practice.

Our findings indicated that knowledge, attitude and practice of this population was inadequate. One recommendation for improving the KAP is to increase the educational programmes. However, the improvements can be made by various systems such as media, universities,

Table 3: Distribution of the food insecurity

	Energy	Protein	Vit B ₂	Vit A	Calcium
Severe food insecure 80% of the recommended values	8	8	56	42	24
Moderate food insecure 80-90% of the recommended values	7	6	13	6	9
High intake 120% of the recommended values	52	60	13	36	44

factories and health ministry personnels. The evaluation of food frequency indicated that the major reasons for infrequent use of milk, fish and vegetables was nonaffordability and dislike and for strawberry, honey, cream, viscera, peach, pomegranate, chicken, jam, date, appricot, citrus, melon, meat, butter, almond, walnut, nut and legumes was nonaffordability. More local studies are needed to identify the key factors affecting the food insecurity (Table 3).

Based on our findings, the generally accepted definition of food insecurity, "whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain ", is not broad enough to include all aspects of food insecurity as experienced by this study (Anderson, 1990). First, it does not adequately capture the importance to this population of having the right foods for health, which is only partly captured by the phrase " nutritionally adequate".

Second, food insecurity includes not only limited or uncertain access to food (ability to aquire), but also the unacquaintance to use food, to prepare, gain access to and/or eat food that is available in the society (Wendy *et al.*, 2003; Radimer *et al.*, 1992).

CONCLUSION

Our view of the food security challenge facing governments is:

- The promotion of free trade in the region.
- Improvement in infrastructure, optimally placed to promote trade.
- Coordination of government actions to develop futures and options markets.
- Building skills in trade policy (Duncan, 1998).

REFERENCES

Anderson, K., B. Dimaranan, T.W. Hertel and W. Martin, 2005. Economic growth and policy reform in the Asia-Pacific:trade and welfare implication. Asia-Pacific Economic Review, (In Press).

- Anderson, S.A., 1990. Core indicators of nutritional state for difficult-to-sample populations. *J. Nutr.*, 54:1559-1600.
- Campbell, C.C., 1991. Food insecurity: A nutritional outcome or a predictor variable? *J. Nutr.*, 35: 408-415.
- Davis, B. and V. Tarasuk, 1994. The continuing challenge of hunger. *Agric. Hum. Values*, 131: 50-57.
- Derrickson, J.P., M. Sakai and J. Anderson, 2001. Interpretations of the "balanced meal" household food security indicator. *J. Nutr. Edu.*, 33: 155-160.
- Duncan, A., 1998. The food security challenge for southern Africa. *Food Policy*, 23: 459-475.
- Hamelin, A.M., M. Beaudry and J.P. Habicht, 2002. Characterization of household food insecurity in Quebec: Food and Feeling. *Soc. Sci. Med.*, 54: 119-132.
- Hamelin, A.M., J.P. Habicht and M. Beaudry, 1999. Food insecurity: Consequences for the household and broader social implications. *J. Nut.*, 122: 525s-528s.
- Hargrove, D., J.A. Dewolfe and L. Thompson, 1994. Food security: What the community wants, learning through focus groups. *J. Can. Diet Assoc.*, 55: 188-191.
- Joda, P. Derrickson, G. Anne Fisher and E.L. Jennifer Anderson, 2001. An assessment of various household food security measures in Hawaii has implications for national food security research and monitoring. *J. Nutr.*, 131: 749-757.
- Lee, Js, E.A. Frongillo, 2001. Nutritional and health consequences are associated with food insecurity among U.S. persons. *J. Nutr.*, 131: 1503-1509.
- Life Science Research Organization, 1990. Core indicators of nutritional status for difficult-to-sample population. *J. Nutr.*, 120: 1559s-1600s.
- Maxwell, S., 1996. Food security: Post-modern perspective. *Food Policy*, 21: 150-170.
- Oldewage-Theron, W.H., E.G. Dicks, C.E. Napier and R. Rutengwe, 2005. A community-based integrated nutrition research program to alleviate poverty: baseline survey. *Public Health*, 119: 312-320.
- Radimer, K.L., C.M. Olson, J.C. Greene, C.C. Campbell and J.P. Habicht, 1992. Understanding hunger and developing indicators to assess it in women and children. *J. Nutr. Edu.*, 24: 36s-45s.
- Rose, D.R., P.P. Basiotis and B.S. Klein, 1995. Improving federal efforts to assess hunger and food insecurity. *Food Rev.*, 18: 18-23.
- Shane, M., L. Teigen, M. Gehlhar and T. Roe, 2000. Economic growth and world food insecurity. *Food Policy*, 25: 297-315.
- Shane, M., L. Teigen, M. Geihar and T. Roe, 2000. Economic growth and world food insecurity: A parametric approach. *Food Policy*, 25: 297-315.
- Tarasuk, V.S., 2001. Household food insecurity with hunger is associated with women's food intakes, health and household circumstances. *J. Nutr.*, 131: 2670-2676.
- Van Heerden, S.M. and H.C. Schonfeldt, 2004. The need for food composition tables for southern Africa. *J. Jfca.*, 17: 531-537.
- Wendy, S., A. Edward and P.V. Frongillo, 2003. Understanding the experience of food insecurity by elders suggests ways to improve its measurement. *J. Nutr.*, 133: 2762-2769.