

## Nutrient Intake during Ramadan in Fasting People Referring to Health Centers in Qom, Iran

Received 3 Oct 2016; Accepted 4 Jan 2017

Mohammad Hozoori<sup>1\*</sup>, Azadeh Kohandani<sup>2</sup>, Ali Mohammadi Veldani<sup>3</sup>, Maryam Mirizadeh<sup>3</sup>

1 Department of Community Medicine, School of Medicine, Qom University of Medical Sciences, Qom, Iran.

2 Young Researchers and Elite Club, Qom Branch, Islamic Azad University, Tehran, Iran.

3 Spiritual Health Research Center, Qom University of Medical Sciences, Qom, Iran.

### Abstract

**Background and Objectives:** During Ramadan, the ninth month in the Islamic calendar, Muslims abstain from eating and drinking from sunrise adhaan to sunset adhaan. This long fasting period can cause change in certain metabolic and hormonal indices and affect eating behaviors and nutrient intake. Therefore, the purpose of this study was to assess nutrient intake in fasting people in Qom, Iran.

**Methods:** We enrolled 120 fasting people aged 20-45 years old living in Qom in Ramadan, 2014. A dietary records questionnaire was used to survey the nutrient intake. All questionnaires were collected after three days. The nutrient intake was determined by Nutritionist IV software and then data compared with recommended values.

**Results:** Energy and macronutrients intake were higher than the recommended values (carbohydrate, 110%; protein, 139%; and fat, 114% of daily values). Except iron (19.8 mg or 108% of daily value), intake of all other micronutrients was lower than the recommended values.

**Conclusion:** The nutrient intake of fasting people in Qom is not appropriate, and is characterized by increased intake of energy and energy suppliers. Therefore, given the undeniable role of proper and adequate nutrient intake in health, it seems necessary for fasting people to receive nutrition education to enhance nutrient intake from various food groups.

**Keywords:** Diet, Fasting, Iran, Nutrient.

\*Correspondence: Should be addressed to Dr. Mohammad Hozoori. Email: mhozoori@gmail.com

Please Cite This Article As: Hozoori M, Kohandani A, Mohammadi Veldani A, Mirizadeh M. Nutrient intake during Ramadan in fasting people referring to health centers in Qom, Iran. Health Spiritual Med Ethics. 2017;4(2):9-11.

## Introduction

During Ramadan, healthy Muslims abstain from eating and drinking from sunrise adhaan to sunset adhaan (1) and fast 12-17 hours (2). Islamic fasting lasts a full lunar month (Ramadan) that would be about 29-30 days (3). Fasting is not obligatory for menstruating, pregnant, or lactating women. Besides that, children, patients, and travelling people are excused from fasting (4). During fasting, Muslims eat two main meals (5). In Ramadan fasting, some changes occurs in lifestyle, sleep pattern, meal frequency, and dietary habits (6). In the recent years, several studies have examined the effects of fasting on health and disease (3-5,7-9). However, few studies have been conducted on healthy nutrition and dietary intake in fasting people. Al-Hourani et al. found that energy and

macronutrients intake of 22 people did not change significantly during Ramadan fasting (1). Besides that, el Ati et al. reported that energy macronutrient intake remained unchanged in fasting people (10).

A study indicated that diet diversity and food consumption in Iranian fasting people were significantly different from the recommended values (2). It seems that reduction in each food group may diminish the dietary intake of some nutrients. Therefore, we conducted this study to investigate the nutrient intake of fasting people with reference to daily values (DVs).

### Methods

This descriptive cross-sectional study was conducted in Qom, Iran during Ramadan, 2014.

Participants were selected from the relatives accompanying patients who had referred to the health centers. Due to the effect of gender on the dietary pattern and selection of various food groups, an equal number of male and female people were enrolled in this study. Then, the questionnaires were administered to 120 fasting men and women (60 males and 60 females) who met the inclusion criteria and provided consent to participate in the study.

To assess the nutrient intake of the participants, a three-page food record questionnaire was given to each participant to be completed during three fasting days one of which was a holiday. Moreover, they were given instructions to correctly record data on their food consumption and the amounts of the used micronutrients using the questionnaire. After collecting the completed questionnaires, nutrients intake was analyzed by Nutritionist IV software (1993; N-Squared, Inc., San Bruno, CA, USA). Then, we compared the daily intake with DVs to determine the percentage of each nutrient (11).

## Result

Forty eight women with breast cancer referred to the Radiotherapy & Oncology Department of Imam Reza (PBUH) Hospital in Kermanshah were the samples of this study.

Table 1: Daily nutrients intake in participants (n=111)

Nutrient	Daily Intake	Daily Value	%
Protein (g)	69.5	50	139
Carbohydrate (g)	329	300	110
Dietary Fiber (g)	13.7	25	54.8
Fat (g)	74.1	65	114
Cholesterol (mg)	180	300	59.8
Calcium (mg)	585	1000	58.5
Magnesium (mg)	201	400	50.3
Iron (mg)	19.5	18	108
Sodium (mg)	1122	2400	46.7
Potassium (mg)	2786	3500	79.6
Zinc (mg)	7.77	15	51.8
Vitamin A (IU)	648	5000	13
Vitamin D (microgram)	0.21	10	2.1
Vitamin E (IU)	4.5	30	15
Vitamin C (mg)	117	60	196

g: gram, mg: milligram, IU: International Unit.

The participants' age range was 29-67 years and most (60.4%) of the participants were middle-aged. Most of the participants were married and only 6.6% single. Regarding

economic status, 56.3% of the participants had poor economic status. Regarding education level, 60.4% of the participants were illiterate and only 4.2% BA/BSc holders (Table 1).

## Discussion

Significantly Our findings indicated that macronutrients intake during Ramadan fasting was higher than the recommended values, and micronutrient intake, except for Iron, was lower than the recommended amounts. According to a recent study on food groups intake (2), we expected that nutrient intake would exceed recommended range.

Consistent with this study, Adlouni et al. (12), Pirsahab et al. (13), and Frost & Pirani (14) found that energy and macronutrient intake of fasting people increased significantly during Ramadan. In contrast, Poh et al. (15), Afrasiabi et al. (16), Al-Hourani & Atoum (1), Larijani et al. (17), and Nomani et al. (9) reported a significant decrease in energy intake of fasting people. This inconsistency in the findings may be explained by differences in the individual characteristics. Consistent with a study (18), age was positively correlated with Ramadan dietary pattern and inversely correlated with Mediterranean dietary pattern. Interestingly, Pirsahab et al. reported a significant increase in energy intake in Ramadan fasting people under 35 years old, but no significant change in over 35-years-old ones (13).

Adequacy of micronutrient intake is shown in Table 1. Consistent with Kiziltan et al. study (19), inadequate intake of all micronutrients (except iron) was observed in the fasting people in the current study. Ramadan fasting is characterized by special meal time and frequency, which may affect nutrients intake in fasting people (1). The nutrient intake pattern of the fasting people in the long term may be highly important, as the nutritional requirements of such people may not be met (15). Thus, an educational program is needed to encourage adoption of healthy habits and monitor nutrient intake. In addition, Ramadan fasting may alter some metabolic factors, endocrine, sleep pattern, and meal time that can affect dietary intake and psychological

conditions (6, 10, 20). Accordingly, we suggest that additional research should focus on fasting effects on healthy nutrition, nutrient intake, and metabolic conditions of fasting people in comparison with non-fasting ones.

This study suffers from certain limitations. The most noticeable limitation of this study is the lack of evaluating nutrients intake before Ramadan. In addition, enrolling larger number of people in this study could have offered more detailed information about this issue. Therefore, it is recommended to compare food intake between before and during Ramadan in order to determine and evaluate the effects of fasting on nutrient intake. Furthermore, it may be useful to measure and follow up anthropometric indices and biochemical parameters to study health effects of fasting.

## Conclusion

Although Ramadan fasting is safe for all healthy people, those with special nutritional needs should consult their dietitians and adhere to healthy nutrition recommendations.

## Conflict of interest

The authors declare no conflict of interest.

## Acknowledgements

No

## References

1. Al-Hourani H, Atoum M. Body composition, nutrient intake and physical activity patterns in young women during Ramadan. *Singapore Med J.* 2007;48(10):906.
2. Kohandani A, Hozoori M, Asafari M. Surveying the Dietary Diversity of Fasting Individuals in Qom in Ramadan. *Health Spiritual Med Ethics.* 2015;2(1):6-10.
3. Azizi F, Siahkoleh B, Shahraz S, Sherafat-Kazemzadeh R, Zali M, Beheshti S. Ramadan fasting and diabetes mellitus. *Arch Iran Med.* 2003;6(4):237-42.
4. Azizi F. Medical aspects of Islamic fasting. *Med J Islam Repub Iran.* 1996;10(3):241-6.
5. Ibrahim WH, Habib HM, Jarrar AH, Al Baz SA. Effect of Ramadan Fasting on Markers of Oxidative Stress and Serum Biochemical Markers of Cellular Damage in Healthy Subjects. *Ann Nutr Metab.* 2008;53(3-4):175-81.
6. Jaleel M, Fathima F, Jaleel B. Nutrition, energy intake- output, exercise, and fluid homeostasis during fasting in Ramadan. *J Med Nutr Nutraceuticals.* 2013;2(2):63-8.
7. Alkandari JR, Maughan RJ, Roky R, Aziz AR, Karli U.. The implications of Ramadan fasting for human health and well-being. *J Sports Sci.* 2012;30 Suppl 1:S9-19.
8. Nematy M, Alinezhad-Namaghi M, Rashed MM, Mozhdehifard M, Sajjadi SS, Akhlaghi S, et al. Effects of Ramadan fasting on cardiovascular risk factors: a prospective observational study. *Nutr J.* 2012;11(1):1-7.
9. Nomani MZ, Hallak MH, Nomani S, Siddiqui IP. Changes in blood urea and glucose and their association with energy-containing nutrients in men on hypocaloric diets during Ramadan fasting. *Am J Clin Nutr.* 1989;49(6):1141-5.
10. el Ati J, Beji C, Danguir J. Increased fat oxidation during Ramadan fasting in healthy women: an adaptative mechanism for body-weight maintenance. *Am J Clin Nutr.* 1995;62(2):302-7.
11. Mahan LK, Raymond JL. Krause's food & the nutrition care process. Netherlands: Elsevier Health Sciences; 2016.
12. Adlouni A, Ghalim N, Benslimane A, Lecerf JM, Saïle R. Fasting during Ramadan Induces a Marked Increase in High-Density Lipoprotein Cholesterol and Decrease in Low-Density Lipoprotein Cholesterol. *Ann Nutr Metab.* 1997;41(4):242-9.
13. Pirsaeheb S, Pasdar Y, Navabi SJ, Rezaei M, Darbandi M, Niazi P. Fasting consequences during Ramadan on lipid profile and dietary patterns. *Asia Oceania J Nucl Med Biol.* 2013;1(2):6-12.
14. Frost G, Pirani S. Meal frequency and nutritional intake during Ramadan: a pilot study. *Hum Nutr Appl Nutr.* 1987;41(1):47-50.
15. Poh B, Zawiah H, Ismail M, Henry C. Changes in body weight, dietary intake and activity pattern of adolescents during Ramadan. *Malays J Nutr.* 1996 Mar;2(1):1-10.
16. Afrasiabi A, Hassanzadeh S, Sattarivand R, Nouri M, Mahboud S. Effects of low fat and low calorie diet on plasma lipid levels in the fasting month of Ramadan. *Saudi Med J.* 2003;24(2):184-8.
17. Larijani B, Zahedi F, Sanjari M, Amini M, Jalili R, Adibi H, et al. The effect of Ramadan fasting on fasting serum glucose in healthy adults. *Med J Malaysia.* 2003;58(5):678-80.
18. Shadman Z, Poorsoltan N, Akhoundan M, Larijani B, Soleymanzadeh M, Zhand CA, et al. Ramadan major dietary patterns. *Iran Red Crescent Med J.* 2014;16(9):e16801.
19. Kiziltan G, Karabudak E, Tuncay G, Avsar F, Tuncay P, Mungan O, et al. Dietary intake and nutritional status of Turkish pregnant women during Ramadan. *Saudi M J.* 2005;26(11):1782-7.
20. Bogdan A, Bouchareb B, Touitou Y. Ramadan fasting alters endocrine and neuroendocrine circadian patterns. Meal-time as a synchronizer in humans? *Life Sci.* 2001;68(14):1607-15.