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A SURVEY ABOUT MICRONUTRIENTS INTAKE IN THE DIET OF FEMALE UNIVERSITY STUDENTS WITH NORMAL WEIGHT AND OVERWEIGHT AND COMPARING IT WITH DETERMINED STANDARDS

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ABSTRACT

Healthy nutrition especially in female student is so important. This study aimed to assessing the micronutrient intakes in female students with or without overweight and comparing them to the set standard values .This study was carried out on 65 female students in 1393. Anthropometrics measures were performed and 7-day food record was used to collect the dietary. Then were compared to the dietary reference intakes (DRI).Results showed significant differences between normal weight and overweight students in Riboflavin, Niacin, Cobalamin, Vitamin C, Iron, Phosphorus, Zinc and Sodium factors. In contrast to Thiamine, Pyridoxine, Folic Acid, Pantothenate, Vitamin E, Vitamin A, Calcium, Copper, Magnesium, Selenium, Potassium factors no significant differences were observed between the two groups .According to dimension on nutrition and effects on the future health of society in aged, it is also suggested to improve strategies and the competence in this area of nutrition.

Keywords: *Girls, Micronutrients, Student*

INTRODUCTION

Nowadays food security and food safety are two important and practical terms used in community health developmental documents. Based on the Article 84 in the 4th program of developing country the government is required to make policies in order to provide good food program and to reduce diseases caused by malnutrition and to increase nutritional culture and education in the society. Country studies have shown that nowadays malnutrition caused by nutritional deficiencies is gradually replaced with malnutrition caused by bad diets and eating too much and we can observe its outcomes and consequences in outbreak of disorders and diseases during midlife (Torabi and Abdollahi, 2013). Country studies about the nutrition patterns of the family have shown that food program of the family have a different value in terms of quality and quantity; in terms of quality the food program has major failures while in terms of quantity it is adequate. In other words, from a quality perspective (cell line or the minerals intake required for the body) from each 10 individuals, 5 individuals have shortage, 3 individuals are high consumers and only 2 individuals are at the desired level (Ghasemi, 1998). Micronutrients, vitamins and minerals have an important role in metabolism, gene expression, safety system, IQ and learning, and thus they are vital for maintaining and promoting health and learning (Shenkin, 2006). Conducted studies show that nowadays micronutrients deficiencies is one of the major health-nutrition problems at macro level of the society and many countries that has undesirable economic-social outcomes which results in slowing the economic development of countries. According to the World Bank calculations, the cost of controlling malnutrition caused by micronutrient deficiencies in each country/society is less than 0.03% of gross domestic product, while this type of malnutrition results in a 5% reduction of GDP (Torabi and Abdollahi, 2013).

University students as a young society and a busy society because of the academic concerns, pay less attention to the proper nutrition styles (Najmabadi, 2005). University students are usually one of the groups who have poor eating habits and need nutrition education (Hazhir, 2006). In a study the lack of receiving vitamins C, E, A, folic acid, pantothenic acid, calcium, magnesium, copper and iron were shown in female university students' diet (Najmabadi, 2005). Studies conducted about the diet of university students living at dormitories in Iran showed a difference in nutritional status of these two groups, and after entering dormitories the hematopoietic nutritious foods intake was reduced (Nader *et al.*,

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2009). In evaluation of Japanese university students' diets it has been reported that the amount of micronutrients intake of minerals, mainly calcium and iron are low and this is due to the effects of changing lifestyle and/or change of residence patterns during studying at universities (Shimbo *et al.*, 2004). As it was mentioned earlier, a large part of Iranian population consist of the youth, and a high percentage of these young people are university students, and a high percentage of them do not have a regular eating pattern during this time. Fear of obesity, and not having a proper standing among their peers result in change of nutrition patterns and nutrient intake. These young people are physically capable and could adapt themselves with the physiological conditions. This group of people does not reveal their shortages and/or reveal disorders with some delays (Torabi and Abdollahi, 2013). On the other hand, physical education university students have different nutritional needs because of having practical courses; due to this matter and due to the importance of micronutrients, the current study has been designed to measure the nutritional status of physical education students of Alzahra University in 2014 in two groups of normal weight and overweight to determine the current status of micronutrients in university students of faculty of physical education; and also to provide supplementary and enriched diets for university students based on determining their nutritional status and comparing it with recommended norms.

MATERIALS AND METHODS

In this research after informing female university students of Alzahra University, 65 individuals were voluntarily chosen as the research sample that had the required conditions such as physical health, no history of illness, no alcohol consumption, non-smoking, and no special drug/food diet. Examinees were divided into two groups of overweight (BMI>25) and normal weight (BMI<25) based on their BMI. In a briefing session after gaining their testimonial and filling out the general information and health questionnaire and anthropometric measurements, with the help of trained experts, the examinees became familiar with filling a 24-hour food record.

Measurements

Weight was measured with the least possible cloth and without any footwear by the use of a digital scale. Height was measured by the use of a tape measure and while participants were standing and without any footwear while shoulders are at normal conditions. BMI was calculated by ratio of weight (Kg) to height squared (Meter). Their general features are shown in table 1.

Table 1: Physical characteristic of the subjects. Data are means (SD)

Groups	Overweight	Normal Weight
Variables		
Weight (kg)	73.09 ± 7.16	56.92± 4.23
Age (cm)	23.1± 4.42	22.19 ± 3.30
Height	161.4 ± 4.24	164.19 ± 2.11
BMI (kg/m ²)	28.55 ± 2.52	21.69 ± 2.7

In order to evaluate the nutrient intake, the 7-day food record was used. With the help of trained experts, the examinees became familiar with filling a 24-hour food record. By showing scale and containers usually used, examinees were asked to report their daily dose. By holding the amount of food intake, the micronutrients intake was determined by the use of software, and then the micronutrient intake was compared by the use of DRI.

Statistical Analysis

By the use of Kolmogorov-Smirnov test the data distribution was conducted. Then according to the normal data distribution, the comparison of two samples test in the amounts of surveyed variables was used. Data analysis was conducted by the use of SPSS16 of windows and at level $\alpha \leq 0.05$.

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RESULTS AND DISCUSSION

Table 2: is show (M ± SD) Micronutrients Intake in two groups, P values and RDA (* Differed significantly < 0.05)

Variable	Normal Weight	Overweight	P value	RDA
VitaminB1 (mg)	0.07 ± 1.64	0.19 ± 1.6	0.11	1.1
VitaminB2 (mg)	0.33 ± 1.992	0.83 ± 2.388	0.038 *	1.1
Vitamin B3 (mg)	3.11 ± 15.16	4.33 ± 20.5	0.045 *	14
Vitamin B6 (mg)	0.12 ± 1.947	0.09 ± 1.714	0.259	1.3
VitaminB12 (mg)	0.12 ± 1.88	0.09 ± 5.59	0.041 *	2.4
Folacin (µg)	69.7 ± 310.3	56.3 ± 348.1	0.10	400
Pantothenic (mg)	2.5 ± 5.49	1.62 ± 6.1	0.096	5
Vitamin C (mg)	29.5 ± 76	12.97 ± 55	0.049 *	90
Vitamin E (mg)	3.2 ± 5.36	2.72 ± 6.99	0.082	8
Vitamin A(µgRE)	402.6 ± 937	321.12 ± 1055	0.061	700
Calcium (mg)	505.1 ± 1050	392.22 ± 1017	0.056	1000
Copper (mg)	0.71 ± 1.86	0.04 ± 1.989	0.22	1.5 -3
Iron (mg)	3.62 ± 10.2	3.11 ± 18.9	0.041 *	18
Magnesium (mg)	0.45 ± 378	83.55 ± 391	0.11	310
Phosphorus (mg)	666.67 ± 1534	345.11 ± 1402	0.044 *	700
Selenium (µg)	43.83 ± 189.9	56.1 ± 192.8	0.098	55
Zinc (mg)	3.3 ± 8.99	3.55 ± 10.35	0.039 *	12
Potassium (mg)	695.2 ± 2898	455.9 ± 2742	0.11	-
Sodium (mg)	809 ± 7454	245.2 ± 9988	0.047 *	-

As it is observable in table 2, there is a significant difference in factors of riboflavin, niacin, cobalamin, vitamin c, iron, phosphorus, zinc and sodium between two groups of university students having normal weight and overweight; while there is no significant difference in factors of thiamine, pyroxene, folacin, pantothenic, vitamin E, vitamin A, calcium, copper, magnesium, selenium, and potassium between two groups. Also in factors of thiamine, riboflavin, niacin, pyroxene, pantothenic, vitamin A, magnesium, phosphorus and selenium for both groups we have observed an intake higher than the recommended amount. Cobalamin had an intake higher than the recommended amount only in participants with overweight. For calcium, copper and zinc we observed an intake amount equal to recommended amount; while folacin, vitamin C, and vitamin E intake was less than the recommended amount. Iron intake in normal weight group was less than recommended amount.

Discussion

Nowadays one of the reasons for prevalence and incidence of cancers and chronic diseases is imbalance. Most vitamins and minerals are recognized as the natural antioxidants in diet and as one of the important factors in preventing chronic diseases such as cardiovascular diseases and cancers. On the other hand, food sources containing these vitamins are accessible food sources and can be easily and inexpensively provided by just a little bit of attention to the food diversity. Food sources containing vitamins and minerals are mostly vegetables, beans, whole grains, and nuts that are easily accessible (Mirzaeian *et al.*, 2010). Based on the current research findings it was determined that the major problem in the surveyed university students' diet is quality and imbalance of providing micronutrients; which means that factors of thiamine, riboflavin, niacin, pyroxene, pantothenic, vitamin A, magnesium, phosphorus and selenium for both groups we have observed an intake higher than the recommended amount. Cobalamin had an intake higher than the recommended amount only in participants with overweight. For calcium, copper and zinc we observed an intake amount equal to recommended amount; while folacin, vitamin C, and vitamin E intake was less than the recommended amount. Iron intake in normal weight group was less than recommended amount. As it has been shown in the country studies of families, in terms of quantity the

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problems are less than the problems related to quality or cell satiety. In other words, the nutritional problem of the society is imbalance and lack of variety and lack of micronutrients intake and energy supply or quantity of a simpler available diet (Torabi and Abdollahi, 2013) . In this regard, the current research showed that the daily energy intake in the group with overweight is averagely 3087 and in group with normal weight is 2373. B vitamins are a class of water-soluble vitamins that should be consumed on a daily basis to provide the body needs, because the body cannot restore them, and these vitamins have an important role in nerves health, metabolism, cellular respiration and hematopoiesis. As it has been determined in the current research, their consumption amount is more than the recommended amount. In this regard, it must be recommended to all the individuals who consume this group of micronutrients more than the recommended amount that the effects of drug abuse in case of using drugs results in headache, convulsion, muscle weakness, irregular heart rhythms (arrhythmias), and allergic reactions such as flushing, resonance of patients with gastric ulcer, exacerbation of asthma symptoms, leaving a toxic effect on the liver and liver disorders, neurological complications associated with walking difficulties, weakness and insomnia (Shenkin, 2006). The most well-known function of vitamin A is in eyesight. Also vitamin A has a very important role in controlling gene functions which means that it results in separation of epithelial cells such as skin, lung, and intestinal tissues from each other. In the current research it has been determined that vitamin A intake is more than the recommended amount. Vitamin A intake more than the recommended amount which is more than 200 Mg per day could result in nausea and vomiting, headache, and increased cerebrospinal fluid pressure. These signs are usually temporary, but high and regular consumption (for example ten times the recommended dose) could result in hair loss, bone and muscle pain, headache, liver damage and increased cholesterol. One of the potential risks for the pregnant women is defects in embryo development (Shenkin, 2006). The current research has shown that the amount of folacin, vitamin C, and vitamin E intake in both groups is less than the recommended amount which is consistent with the research results of Najmabadi (2005) on university students of Iran University of Medical Sciences, Esfanjani results on university students of Ardabil University of Medical Sciences (Tarighat *et al.*, 2003; Johnston *et al.*, 1998) results on campus students of Arizona State University and (Klosiewicz-latoazek *et al.*, 2002) results on university students of Medical University of Warsaw. Folacin acts as a coenzyme in normal DNA synthesis and as a part of a coenzyme in synthesis of amino acids and nucleoprotein, and it results in improvement of formation of red blood cells. Folic acid is an important vitamin during pregnancy. Fatigue, lack of energy, sleep problems and wanes, pain, red tongue, and mild mental effects are some of the symptoms of lack of folic acid. The only conclusive evidence about the properties of vitamin C is that vitamin C is beneficial for growth and repair of body tissues, healing wounds, scars and also repairs and maintains health of cartilage and bones and teeth. Low intake of vitamin C could result in bleeding gums, reduced ability of the body to fight against infections, reduced ability of the body to heal wounds, dry and damaged hair, gingivitis, nosebleeds, weight gain due to decreased metabolism, dry and rough skin, painful and swollen joints (Shenkin, 2006). Foods rich in vitamin E delay skin aging and guarantee strength of body cells. Anemia, weakness, eye paralysis and respiratory dysfunction are some of the symptoms of lack of vitamin E (Shenkin, 2006). Only in group with normal weight the amount of iron intake was lower than the recommended amount which is inconsistent with research results of Navaei et al (2010) and Menzie et al (2008) who reported that in fat people iron intake is 44% (Navai *et al.*, 2010; Menzie *et al.*, 2008). Perhaps one of the reasons for more iron intake of group with overweight is because of the total energy intake which is more than the normal weight group. The amount of zinc intake in this study was normal while (Mahmoudi *et al.*, 2008) reported 31% shortage, (Sfar *et al.*, 2009) reported 45% shortage and (Kimiagar *et al.*, 1989) reported 1% shortage of zinc. In the current research no difference was observed about the copper intake of two groups, which is consistent with research results of Navaei *et al.*, (2010); while some researchers reported that there is a positive relationship between BMI and copper intake (Laitinen *et al.*, 1989). The reason to this difference could be due to the difference of conditions in surveyed geographic areas, difference of age groups, and difference in dietary patterns. The current research results showed that the calcium intake in both groups matches the recommended dose. One of the reasons to this matter could be due to the

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nutritional information and education spread during the previous years in the country about calcium intake. Generally, difference of age groups, difference in dietary patterns, lifestyle, residence patterns, use of prepared and canned foods, types of dishes and cooking, and air pollution could affect the differences and results of the researches.

In this regard it is suggested to take the following measures to have adequate, balanced and diverse diet for the university students:

- Promoting cultural and nutritional education
- Main sources of micronutrients, dairy, fruit, vegetables and nuts. It seems that one of the major problems of university students (especially those living at dormitories) is preparation and storage of this group of nutrients; due to this reason, facilitating access to fresh and natural food for the university students could be a significant help.
- Continuous monitoring of nutritional status of university students
- Monitoring full compliance of nutritional tips on self-service foods and food variety
- Nutritional supports especially for certain groups (supplementation)

Conclusion

Based on the above mentioned results it could be concluded that for having health and vitality it is necessary to have an adequate, balanced and varied diet and to meet the nutritional requirements it is vital to use vitamins, minerals and other nutrients with the proper and sufficient amount. Also use of medicines unless prescribed by experts is not recommended; because medicines have side effects and excessive use results in adverse and perhaps irreparable disorders.

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