

Department of Clinical Dietetics, Nursing and Health Sciences Faculty
Medical University of Lublin

RENATA KRZYSZYCHA, JANUSZ BIELAK, BOGDAN SZPONAR

*Quantitative assessment of dietary habits among female students
of the Medical University of Lublin in the academic year 2006/2007*

The functioning of an organism and occurrence of various diseases depend, among other things, on the quality and quantity of food consumed. According to Szponar (1), 30–50 of nosological entities or health abnormalities are caused by inadequate health quality of food, bad dietary habits and substance abuse. Therefore, the studies on dietary habits should be carried out to determine the dietary tendencies of a given population and possible abnormalities. Monitoring of dietary habits and their health effects provides the grounds to design appropriate dietary policy.

The aim of the present study was to assess quantitatively the dietary habits of female students of the Medical University of Lublin in the academic year 2006/2007.

MATERIAL AND METHODS

The study was conducted among 82 female students in autumn (October–November) 2006. The dietary habits were assessed using the last 24-h dietary history, including the picture album of food products and meals of various sizes of portions designed in the Institute of Nutrition in Warsaw (2). The questionnaire material was used to determine the energy and nutritional value of daily food rations consumed by the students. The calculations were conducted using the “Dietician” software.

With the losses related to technological and culinary processes (10%) taken into account, the results were compared to the standards by Ziemiański and colleagues (3). The reference point was the standard mean recommended for women aged 19–25 years of moderate physical activity. The $\pm 10\%$ deviations from the standard were not questioned.

RESULTS

The study results concerning the energy derived from the individual food components are presented in Figure 1. The analysis of distribution of individual food components in students' food rations demonstrated that proteins constituted 14.6% of total energy in meals, fats – 32.2% while carbohydrates – 53.2%, including 6% of energy derived from saccharose. The mean values of quantitative evaluation of food rations with the percentage of standard fulfilled are presented in Table 1. The mean daily food ration of students met the energy and protein requirements in 78% of the recommended values. The deficiencies were also visible in relation to fats (83.9%), carbohydrates (70.6%) and dietary fibre (57.6%). The values of cholesterol were found to be normal – below 300 mg/day.

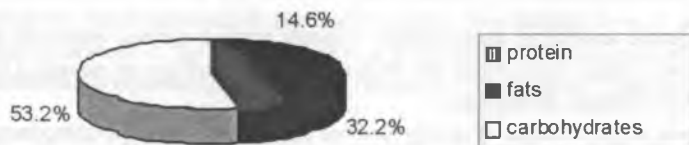


Fig. 1. Percentages of energy derived from major components in daily food rations of students

Table 1. The content and percentage of standards of energy and basic components fulfilled by daily food rations of students

Components	Units	Mean value $\bar{x} \pm$ SD	Recommended weighted average	Per cent of standards fulfilled in the examined population
Energy	kcal	1774 \pm 674	2275	78.0
Total protein	g	62.45 \pm 24.9	80	78.0
Animal protein	g	41.39 \pm 20.4	-	-
Plant protein	g	21.06 \pm 9.9	-	-
Fats	g	63.77 \pm 33.1	76	83.9
Cholesterol	mg	269.63 \pm 304.6	>300	89.9
Total carbohydrates	g	224.50 \pm 91.0	318	70.6
Saccharose	g	40.97 \pm 37.9	56.9	72.0
Starch	g	112.14 \pm 66.8	-	-
Dietary fibre	g	17.29 \pm 10.78	30	57.6
Potassium	mg	2214.12 \pm 1231.6	3500	63.3
Calcium	mg	645.99 \pm 438.5	1200	53.8
Phosphorus	mg	1098.04 \pm 523.0	900	122.0
Magnesium	mg	234.82 \pm 148.7	300	78.3
Iron	mg	9.70 \pm 5.42	18.5	52.4
Zinc	mg	8.15 \pm 3.86	13	62.7
Copper	mg	0.85 \pm 0.48	2.25	37.8
Vitamin A	ug	1063.87 \pm 2433.7	800	132.9
Vitamin E	mg	7.46 \pm 4.71	8	93.2
Vitamin C	mg	85.04 \pm 83.76	70	121.5
Vitamin B ₁	mg	1.58 \pm 75.38	1.9	83.1
Vitamin B ₂	mg	1.46 \pm 0.90	1.8	81.1
Vitamin B ₆	mg	1.24 \pm 0.66	2.0	62.0
Niacin	mg	11.65 \pm 7.93	21	55.5

The study revealed extremely high deficiencies in daily requirements for minerals, e.g. potassium (63.3%), calcium (53.8%), magnesium (78.3%), iron (52.4%), copper (37.8%) and zinc (62.7%) as well as excessive amounts of phosphorus (122.0%).

There were no deficiencies found in antioxidative vitamins such as A, C and E while the daily food rations did not cover the requirements for B₁ (83.1%), B₂ (81.1%), B₆ (62.0%) and niacin (55.5%).

DISCUSSION

The quantitative analysis of dietary habits of female students showed numerous abnormalities. The energy value of daily food rations was found to be 1774 kcal/day on average, i.e. the findings revealed substantial energy deficiencies.

The analysis of percentages of energy derived from individual food components in relation to the total energy value of the rations consumed showed fat and carbohydrate abnormalities. In the examined meals, these components provided 32.2% and 53.2% of energy, respectively; this does not meet the dietary recommendations which suggest an increase in the supply of energy from carbohydrates to 55–65% and a decrease in the energy from fats to 30% (3).

According to the above recommendations, the percentage of energy derived from proteins should be 12–15%, thus it may be assumed that food rations of the examined students fulfilled the recommendations and were within the upper normal range. A high percentage of energy from fats and low of that from carbohydrates was also observed by other authors, e.g. Ilow and Rogulska (4), Szajkowski et al. (5), Olędzka et al. (6) and Maruszewska et al. (7).

The assessment of total protein intake in our population showed the 22% deficiency. It should be stressed that the percentage of animal protein in total protein values was found to be high (66%). Taking into account the role of dietary proteins as a source of nitrogen for protein synthesis in the organism and the relation between its intake and health, the deficit of this component observed in the examined group is alarming.

The findings concerning the kind of proteins consumed correspond to the results reported by others (8, 9). Moreover, they reflect the tendency to the increase in the percentage of animal protein in its total amount (8) observed in the Polish population for more than 30 years.

With a slightly increased percentage of fats in daily food rations, the intake of this component, similarly to that of carbohydrates, was lower than the accepted standards. Low intake of carbohydrates indicates insufficient intake of cereals, potatoes, vegetables and fruits observed in the examined population. The increased supply of the products mentioned above would also result in decreased shares of fat-derived energy, which is extremely unfavourable from the health-related point of view (4).

Furthermore, low shares of cereals, vegetables and fruits in daily food rations are revealed by very low intake of dietary fibre, i.e. 17.3 g/day while its average supply should be 30 g/day. Considering the role of this component in the prophylaxis of diseases, including atherosclerosis, ischaemic heart disease or obesity, the results obtained in the present study are extremely alarming. Moreover, the findings confirm the data reported by other authors (8, 10).

The findings disclosed deficiencies in potassium, calcium, manganese, copper, iron and zinc as well as in vitamin B in daily food rations of the students, which is likely to indicate too low intake of milk, its products, meat, cereals and potatoes.

In contrast, the intake of phosphorus substantially exceeded the accepted standards (122%). High intake of phosphorus is unfavourable, especially when accompanied by marked calcium and magnesium deficiencies. The calcium/phosphorus ratio in the organism should be 1:1; when one element predominates, the excretion of the other one increases. In our students with so high calcium deficits, high levels of phosphorus are likely to contribute to the development of osteoporosis, dysfunctions of the myocardium, muscular system and kidneys. High intake of phosphorus may also decrease the absorption of magnesium. The deficiency of this element in the diets analysed may predispose to future development of atherosclerosis (4).

The amount of zinc in the students' diets was also deficient, covering 62.7% of the recommended intake, which is directly related to protein deficits in the analysed diets.

In the material examined, only the intake of antioxidative vitamins was normal, which may be highly favourable for the prophylaxis of metabolic diseases. Our findings were in agreement with those found among students of the Warsaw Technical University by Ołędzka and colleagues (6) yet different from the results reported by Iłow and Rogulska (4) of the Medical University in Wrocław.

CONCLUSIONS

1. The meals consumed by female students did not provide sufficient energy and were characterized by improper proportions of the main nutritional components, which is reflected in too high supply of fats and coexisting deficiency of carbohydrates.

2. Food rations showed deficiencies in all nutritional components, except for phosphorus and antioxidative vitamins.

3. The examined diets included deficient amounts of dietary fibre while their level of cholesterol was normal.

4. Poorly balanced diets of women are likely to contribute to increased risks of diet-related diseases and therefore, proper and conscious dietary habits should be promoted since the early youth.

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SUMMARY

The main aim of the study was to assess quantitatively the dietary habits of female students of the Medical University of Lublin in the academic year 2006/2007. The study was conducted amongst 82 students in autumn (October–November) 2006. The 24-hour dietary questionnaire and the album of photos of products and meals of various portion sizes designed in the Institute of Nutrition in Warsaw were used. The questionnaire material was the basis for the determination of the energy and nutritional value of daily food rations of the university students. The calculations were performed using the “Dietician” software. Having accounted for losses (10%) connected with technological and culinary processes, we compared the results with the standards by Ziemiński and colleagues. The reference was the mean standard recommended for women aged 19–25 years of moderate physical activity. The deviations from the standard within the range of $\pm 10\%$ were not questioned. The study showed that the meals consumed by the students did not provide sufficient amounts of energy and were characterized by improper proportions between the main nutritional components, which was expressed in too high supply of fats and coexisting carbohydrate deficiencies. The food rations contained deficient amounts of all nutritional components, except for phosphorus and antioxidative vitamins. The diets were characterized by insufficient amounts of dietary fibre and normal level of cholesterol. Poorly balanced diets of women may contribute to increased risks of diet-related diseases, therefore proper and conscious dietary habits should be promoted from the early youth.

Ocena ilościowa sposobu odżywiania się studentek Akademii Medycznej w Lublinie
w roku akademickim 2006/2007

Głównym celem pracy była ocena ilościowa sposobu odżywiania się studentek Akademii Medycznej w Lublinie w roku akademickim 2006/2007. Badania przeprowadzono w okresie jesiennym (październik – listopad) 2006 r. wśród 82 studentek. Do oceny sposobu żywienia zastosowano metodykę wywiadu żywieniowego z ostatnich 24 godzin przed badaniem z wykorzystaniem albumu fotografii produktów i potraw o zróżnicowanej wielkości porcji, opracowanego przez IŻŻ w Warszawie. Uzyskany materiał ankietowy stanowił podstawę do określenia wartości energetycznej i odżywczej całodziennych racji pokarmowych, spożywanych przez młodzież akademicką. Obliczenia dokonano wykorzystując technikę komputerową w oparciu o program „Dietetyk”. Uzyskane wyniki po uwzględnieniu strat (10%) związanych z procesami technologicznymi i kulinarnymi porównano z normami Ziemińskiego i wsp. Jako punkt odniesienia przyjęto wartość średnią norm zalecanych dla kobiet w wieku 19–25 lat o umiarkowanej aktywności fizycznej. Odstępstwa od norm w granicach $\pm 10\%$ nie były kwestionowane. Przeprowadzone badania wykazały, że posiłki spożywane przez studentki nie zapewniły wystarczającej ilości energii oraz odznaczały się niewłaściwymi proporcjami pomiędzy podstawowymi składnikami odżywczymi, co wyrażało się zbyt wysoką podażą tłuszczów przy współistniejącym niedoborze węglowodanów. W racjach pokarmowych stwierdzono niedobory wszystkich składników odżywczych z wyjątkiem fosforu oraz witamin antyoksydacyjnych. W analizowanych jadłospisach stwierdzono niewystarczające ilości błonnika pokarmowego, natomiast poziom cholesterolu był prawidłowy. Źle zbilansowana dieta kobiet może przyczynić się do zwiększenia ryzyka powstania chorób na tle nieprawidłowego żywienia, dlatego już we wczesnej młodości należy propagować prawidłowe i świadome zachowania dietetyczne.