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European Journal of Experimental Biology, 2014, 4(1):638-641

ISSN: 2248 –9215
CODEN (USA): EJEBAU

Investigation of dietary patterns and physical fitness factors in inactive students

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ABSTRACT

The Purpose of this study was to investigation of Dietary pattern and physical fitness factors in inactive students. For this purpose, 60 female students of Alzahra University were selected as subject and were divided into two groups of students with overweight (26 students) and students with normal weight (39 students). Then, the food pattern of the subjects was collected using 24-hour dietary recall questionnaire and also physical fitness factors including flexibility, sit-up, 540-m running and 4×9 running and BMI were taken from the subjects. Research results showed that energy intake in breakfast and dinner meals and intake of protein, total fat and saturated fat in the student group with overweight was significantly more than those of students with normal weight and carbohydrate intake in the group with overweight was lower than that in the group with normal weight . Evaluation of the physical fitness factors also showed that the number of sit-up, flexibility, speed of running and BMI of the students with overweight were higher than those with normal weight. Results of this research showed that the students with overweight received significantly more protein, total fat and saturated fat than the students with normal weight and receive less carbohydrate. Therefore, having such food pattern in these students' leads to overweight and obesity in them which in turn leads to loss of physical performance in them. Therefore, to improve physical performance of the students, the sport trainers are recommended to design and execute physical exercise plans for improving and controlling body composition of the students.

Key words: Dietary pattern, physical fitness factors, Body Mass Index

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INTRODUCTION

Physical fitness n students and the young is a fundamental and vital case which ensures health of the people in society. Increase of efficiency of the body is not achieved but through physical exercise and motor activities and physical exercise should be regarded as a complementary part of lifestyle. Performing physician fitness tests in many countries particularly in industrial countries in the past decades manifested this bitter fact that motionless lifestyle resulting from automation of affairs, excessive welfare and omission of muscular exercise and physical activities and motor inability endangers health of the future generation. Today, incidence of obesity in the teens and young is growing all over the world and has been converted into one of their health problems[1, 2]. Obesity is a consequence with multiple causes and variations in lifestyle such as improper food habits and reduction of physical activity and immobility are of the other causes of obesity in addition to genetic, metabolic effects, culture, economic

and social condition. Researches in Australia, Canada and countries such as China and Brazil also indicate increase of obesity incidence in students and the young[3, 4]. Some studies also show that incidence of overweight is between 13 and 25 in this age group and incidence of obesity is between 7.7 and 8% [5]. In a study which was conducted in 2007, incidence of overweight was reported 10.2% and risk of overweight was reported 11.2% [6]. These factors can be accompanied by short-term complications such as psychological problems, eating disorders and low quality of life and also the problems in memory , concentration, learning and educational failure and long-term complications such as diabetes , hypertension ,l cardiovascular disease , gallstones disease , osteoarthritis , colon cancer , respiratory complications during sleeping in the future[7-9]. Considering incidence of overweight and obesity and also behavioral characteristics of teen years which made omission of factors affecting routine life such as food with low food value and immobility very difficult, therefore, it seems that execution of interventions for correcting their lifestyle has been regarded as one of the main problems of society and intervention in this regard is fully compulsory. Considering that university is a place in which students spend most of their hours and which provides enough opportunity for education and creation of healthy food options and increasing enough physical activity [8], the presence and expansion of the mentioned problems show that such interventions are fully suitable and necessary because obesity in these ages increases[10]. Studies show that active role of students not only in intervention is necessary but has considerable role in stability of food habits and lifestyle in future [11]. Multidimensional interventions include improvement of food pattern, increase of physical activity and reduction of low mobility (watching television and use of computer) which have positive effects on weight variations[12, 13]. Considering that immobility, improper food pattern and overweight are threat for health of this vulnerable group and is regarded as alarm for health of the future generation of society and awareness with this case can be effective in formulation of suitable strategies for improving lifestyle and physical health of this group. Therefore, goal of the present study is to determine food pattern and physical fitness and anthropometric indices among female inactive students of Alzahra University.

MATERIALS AND METHODS

Participants

In this cross-sectional research in 2012, students of Faculty of Physical Education and sport sciences of Alzahra University were selected with direct anthropometric method and measurement of their height and weight and their body mass index (BMI) values were calculated (weight in kilograms divided by the squared height in metres)[14]. Thus 26 subjects with mean BMI of 2.55±1.52 kg/m^2 were identified as students with overweight and obesity and 39 subjects with mean BMI of 21.69±1.14 kg/m^2 were identified as students with normal weight and selected as studied samples and they received and filled the questionnaire containing personal specifications, history of health and physical activity. The participants' general characteristics are given in Table 1.

TABLE 1. GENERAL CHARACTERISTICS OF THE SUBJECTS

Group Variable	Students with overweight 26= N	Students with overweight N= 39
Age(year)	22.44 ±1.7	22.19 ±1.83
Weight(kg)	63.63 ±3.72	59.01 ±1.93
Height (cm)	160.98 ±2.25	164.19 ±2.11

Physiological measurement

To determine condition of physical fitness of the subjects , tests of flexibility , sit-up, horizontal bar hanging and beep test were used and to measure anthropometric indices, weight and height were measured using Beurer portable digital balance made in Germany with precision of 100 g with the minimum clothing and without shoes and Seca portable height meter with precision of 0.1 cm.

Also, the participants' diets were monitored using the 24-h food recall questionnaire standardised by the Nutrition Group, Tehran University of Medical Sciences.

Statistical method

To analyze research data, descriptive statistics method was used for expressing mean and standard deviation of the variables and to recognize normal distribution of data, Kolmogorov– Smirnov test was used and to compare the research variables in the groups with overweight and normal weight, independent t-test was used with SPSS software, version 16.

RESULTS

The results obtained from the current study showed that 26 out of students participating in this study had overweight and obesity and 39 students had normal weight based on age and height and were 40% and 60% of the participants, respectively.

Study of energy intake in students with overweight and normal weight showed that energy intake in breakfast and dinner meals and intake of protein, total fat and saturated fat in the student group with overweight was significantly more than those of students with normal weight and carbohydrate intake in the group with overweight was lower than that in the group with normal weight . Evaluation of the physical fitness factors also showed that the number of sit-up, flexibility, speed of running and BMI of the students with overweight were higher than those with normal weight (Table 2).

Table 2- variations of mean and standard deviation of energy in food meals and macronutrients among subject

Variable **Groups**	breakfast meal intake (kilocalories)	Lunch meal intake (kilocalorie)	Dinner meal intake (kilocalorie)	Snack energy intake (kilocalorie)	Protein intake percent	Carbohydrate intake percent	Total fat intake percent	Saturated fat intake percent
Group with overweight N=26	1315 ±36.96	756 ±46.22	706 ±30.99	310 ±25.90	12.7 ±4.31	49.5 ±12.06	34.8 ±6.09	20.1 ±3.6
Group with normal weight N= 39	1065 ±5.11	736 ±31.20	262 ±12.10	210 ±5.98	9.8 ±2.62	65.6 ±8.14	24.6 ±7.3	13.8 ±3.9
P-value	0.043	0.061	0.048	0.059	0.046	0.039	0.049	0.047

Study of the relationship between physical fitness and anthropometric indices of the subjects showed significantly high number of sit-up , flexibility , running speed and body mass index of the students with overweight compared with students with normal weight while there was no significant difference between their4×9 running times (Table 3).

Table 3- variations in mean and standard deviation of the physical fitness indices and body composition among subject

Variable **Groups**	**sit-up (Number)**	**4×9 running (second)**	**540-m running (Min)**	**Flexibility (Cm)**	**Body mass index (kg/m^2)**
Group with overweight N=26	29.92 ±7.58	29.92 ±7.58	3.51 ±1.11	33.91 ±5.60	28.55 ±1.52
Group with normal weight N= 39	41.40 ±5.11	41.40 ±5.11	2.21 ±0.25	49.01 ±3.10	21.69 ±1.14
P-value	0.040	0.069	0.044	0.041	0.038

DISCUSSION

Results of the present research showed that energy intake in breakfast and dinner meals and intake of protein, total fat and saturated fat in the student group with overweight was significantly more than those of students with normal weight and carbohydrate intake in the group with overweight was lower than that in the group with normal weight . In this regard**,** results of the present research are in line with results of research by Savoye et al. 2007, Timlin et al. 2008, Redwood et al. 2008, Rampersaud et al. 2005, Mada et al. 2014 [15-19] and not in line with janssen et al. 2004, Jiang et al. 2008[20]. It seems that difference in sample size and intervention group and also difference in season of study were effective on the results obtained in the previous studies. Difference between energy intake and energy expenditure in both groups shows that there is significant difference in the group with overweight in distribution of energy intake in food meals in addition to increase of intake compared with the required value and there is no significant difference in the group with normal weight between the energy intake and required energy but energy distribution in diet is not based on recommendations of this age group and it seems that there is need for education in national level or formulation of suitable diets in university textbooks and these results are in line with studies by Deliens et al. 2014, Aounallah et al. 2008, Al-Hazzar et al. 2011, Aboullfotouh et al. 2007 and[21-24] not in line with study by Moreno et al. 2008 in terms of the required energy[25].

The research results showed that the number of sit-up, flexibility, speed of running and body mass index of the students with overweight were significantly higher than those of students with normal weight, therefore, study of physical fitness condition of the group with overweight and the group with normal weight shows that the group with overweight didn't attain the required standard which indicates weakness of these people in fitness. In 4×9 running test, the people with overweight and obesity and the group with normal weight didn't attain desirable rank indicating that they are not agile enough. It seems that motor weakness and failure to follow regular diets and excessive immobility caused lower muscular resistance, muscular strength and fragility based on fitness evaluation tests in both groups causing problems in the coming years due to loss of physical fitness index and consequently increase of noncontiguous disease.

CONCLUSION

Therefore, considering the research results, it can be mentioned that intake of protein, total fat and saturated fat in the student group with overweight was significantly more than those of students with normal weight and carbohydrate intake in the group with overweight was lower than that in the group with normal weight and probably, having such food pattern in these students led to overweight and obesity in them which led to loss of their physical performance. Therefore, to improve physical performance of the students, the sport trainers are recommended to design and execute physical exercise plans for improving and controlling body composition of the students.

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