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Body Mass Index and Dietary Habits among Nursing College Students Living in the University Residence in Kirkuk City, Iraq

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***Abstract*—**Obesity prevalence is increasing worldwide. University life is a challenging period especially for students who have to leave their familiar surroundings and settle in a new environment. The current study aimed to assess the diet and exercise habits and their association with body mass index (BMI) among nursing college students living at Kirkuk University residence. This was a descriptive study. A non-probability (purposive) sample of 101 students living in Kirkuk University residence was recruited during the period from the 15th November 2015 to the 5th May 2016. A questionnaire was constructed for the purpose of the study which consisted of four parts: the demographic characteristics of the study sample, eating habits, eating at college and healthy habits. The data were collected by interviewing the study sample and the weight and height were measured by a trained researcher at the college. Descriptive statistical analysis was undertaken. Data were prepared, organized and entered into the computer file; the Statistical Package for Social Science (SPSS 20) was used for data analysis. A p value≤ 0.05 was accepted as statistical significant. A total of 63 (62.4%) of the sample were aged20-21with a mean age of 22.1 (SD±0.653). A third of the sample 38 (37.6%) were from level four at college, 67 (66.3%) were female and 46 45.5% of participants were from a middle socio-economic status. 14 (13.9%) of the study sample were overweight (BMI =25-29.9kg/m^2) and 6 (5.9%) were obese (BMI≥30kg/m^2) compared to 73 (72.3%) were of normal weight (BMI =18.5-24.9kg/m^2). With regard to eating habits and exercise, 42 (41.6%) of the students rarely ate breakfast, 79 (78.2%) eat lunch at university residence, 77 (78.2%) of the students reported rarely doing exercise and 62 (61.4%) of them were sleeping for less than eight hours. No significant association was found between the variables age, sex, level of college and socio-economic status and BMI, while there was a significant association between eating lunch at university and BMI (p =0.03). No significant association was found between eating habits, healthy habits and BMI. The prevalence of overweight and obesity among the study sample was 19.8% with female students being more obese than males. Further studies are needed to identify BMI among residence students in other colleges and increasing the awareness of undergraduate students to healthy food habits.

***Keywords*—**Body mass index, diet, obesity, university residence.

I. Introduction

OBESITY is often defined as a condition of abnormal and excessive fat accumulation in adipose tissues to the extent that health may be adversely affected [1]. Obesity prevalence is increasing worldwide at an alarming rate in both developing and developed countries. Current estimates from the World Health Organization (WHO) report published in 2014 stated that more than 1.9 billion adults, 18 years and older, were overweight, Body Mass Index (BMI≥25kg/m2). Of these, over 600 were obese. 39% of adults aged 18 years and over were overweight in 2014, and 13% were obese [2]. Moreover, it is a risk factor for many diseases such as certain cancer, hypertension, type2 diabetes mellitus, metabolic syndrome and coronary heart disease [3].

One of the major causes of obesity is the changes in the diet, in term of quantity and quality which has become more Westernized [4]. These dietary changes were accused for increasing the prevalence of both overweight and obesity observed among college student are highly exposed to unhealthy eating habits leading to body weight gain [5], [6].

University students represent a population which is aged from late adolescent-hood to early adulthood. For many, starting university also means living away from home. Many university students live in residential accommodation and this is a transitional period between living with parents and living independently [7].

University life is a challenging period especially for students who have to leave their familiar surrounding sand settle in a new environment. The unfamiliar environment may have an impact on their personality, attitudes and behavior [8]. The start of university studies is an important stage in the life of an individual because it often coincides with assumption of greater responsibility concerning both the maintenance of a healthy lifestyle and food choices [9].

The diet of University students has been modified by the influence of technology, fast food and social conditions. Poor food habits during this stage can result in serious consequences that can be further aggravated by physical stress and emotional problems [5]. During the academic term, the students are forced to spend many hours away from home and inevitably to change their eating habits. This entails more frequent consumption of foods in restaurants and canteens, as well as an increased reliance on quick- or easy-to-prepare meals [10].

Nurses play a key role in addressing the epidemic of overweight and obesity in Iraq on a primary level of through the patient education. According to my knowledge, no published studies to date have addressed these issues amongst university residence students in Kirkuk city

The objectives of the current study were to assess the diet and exercise habits and their association with body mass index

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(BMI) among nursing college students living at Kirkuk University residence, as well as to find out the demographical characteristics of the study sample and to find out the association between some demographical factors and BMI.

II. Methods

A. Population and Setting

A total of 101 students (34 male, 67 female) full time undergraduate students of 18 years and older living in Kirkuk University residence was recruited during the period from the 15th November 2015 to the 5th May 2016 from college of nursing at Kirkuk University.

B. Ethical Consideration

This study was carried out after being approved by the ethics committee in the college of nursing at university of Kirkuk. Participation was voluntary and prior to filling the questionnaire a formal consent was obtained from the students who agreed to participate in the study. No students were under obligation to participate, they informed that participation would not carry any cost or receive any compensation.

C. Design

Descriptive study, non-probability (purposive) sample

D. Inclusion Criteria

- Gender (male and female)
- Students living in the university residence
- Single
- Full time students (study level 2nd,3rd,4th year)

E. Exclusion Criteria

- Married students
- Students living with parents
- Students having diet problems
- 1st year level students

F. Data Collection

A questionnaire was constructed for the purpose of the study which consisted of four parts: part one; the socio demographic characteristics of the study sample which include (age, gender, level at college, monthly income, smoking and BMI), part two; eating habits which include main items divided into sub items (Breakfast meal, lunch meal, Dinner meal), the answer for these questions was scaled into three scales as (3 for always, 2 for some time and 1 for rarely). Part three: eating at college which includes three items; type of meal eaten at college (breakfast, lunch), which type of food you eat at college (sandwich, biscuits, chocolates, crisps and fries), preferred drink (tea, coffee, juice, fizzy drinks and yogurt). Part four: Healthy habits which include eight items; physical activity, daily sleeping, having nap, eating ice cream, recording weight, follow physical activity program, eating nuts and drinking water.

The data were collected by interviewing the study sample and the Body Mass Index (BMI) which is the ratio of weight in kilogram to height in meter square was used to assess body weight status. According to the WHO classification of adult BMI as underweight (BMI<18.5kg/m2), Normal weight (BMI=18.5-24.9kg/m2), overweight (BMI=25-29.9kg/m2) and obese as (BMI≥30kg/m2) were measured by a trained researcher at the college. Descriptive statistical analysis was undertaken. Data were prepared, organized and entered into the computer file; the Statistical Package for Social Science (SPSS 20) was used for data analysis. A p value≤ 0.05 was accepted as statistical significant.

III. Results

A. Socio-Demographic Characteristics of the Nursing Students

A total of 101 students living in the university residence showed that 63 (62.4%) of the sample were aged 20-21with a mean age of 22.1 (SD±0.653). A two third of the sample 67 (66.3%) were female and 46 (45.5%) of participants were from a middle socio-economic status, with majority 91(90.1%) of them being non-smoker (Table I). The data in the pie diagram (Fig. 1) shows that the most 38 (37.6%) of the students were from academic study level four, 31 (30.7%) were from academic study level three and 32 (31.7%) from academic study level of 2nd year at college.

B. Body Mass Index Distribution

According to the World Health Organization (WHO) Classification of BMI [2], the result showed in Fig. 2 that 14 (13.9%) of the study sample were overweight (BMI =25-29.9kg/m2) and 6 (5.9%) were obese (BMI≥30kg/m2) compared to 73 (72.3%) were of normal weight (BMI =18.5-24.9kg/m2).

C. Eating Habits Distribution Among Study Sample

Forty-two (41.6%) of the study sample were rarely eating breakfast, with majority 79 (78.2%) of them eating lunch in the university residence and 88 (87.1%) of the students eating dinner daily. Most of the study participants 52 (51.5%) reported eating rice rarely with 38 (37.6%) and 39 (38.6%) of them eating cooked vegetables 2-3 weeks and rarely respectively (Table II).

D. Food at College

The majority of the sample 80 (79.2%) of the students reported that the breakfast is the most meal eating in college with 26 (61.4%) of them eating sandwich as the most type of food eating in the college.

E. Healthy Habits

Regarding practicing healthy habits, 77 (76.2%) of the study sample were rarely doing exercise with 52 (51.5) not monitoring their weight regularly and a third of them 39 (38.6%) drinking water from 6-8 cups per day, with 62 (61.4%) of them being sleeping less than 8 hours.

F. Association Between Eating Habits and BMI Among the Study Sample

No significant association was found between most of eating habits variables and BMI, however half of the obese students 3 (50%) were rarely having their breakfast and 11 (78.6%) of overweight and 5 (83.3%) of obese students were eating rice

daily with 8 (57.1%) of overweight eating cooked vegetables from 2-3 weeks. While, there was significant association between eating lunch at university residence and BMI at p value (0.03) (Table III).

TABLE I
DEMONSTRATES SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE WHOLE STUDY SAMPLE

Socio-demographic characteristic		Frequency (*f*)	Percentage (%)
Age	< 20 year	10	9.9
	20-21 year	63	62.4
	22-23 year	25	24.8
	24 > year	3	3
Total		101	100
Mean& SD 22.1±0.653			
Gender	Male	34	33.7
	Female	67	66.3
Total		101	100
Socio-economic status	High	35	34.7
	Middle	46	45.5
	Low	20	19.8
Total		101	100
Smoking	Smoker	9	8.9
	Non-smoker	91	90.1
	Ex-smoker	1	1
Total		101	100

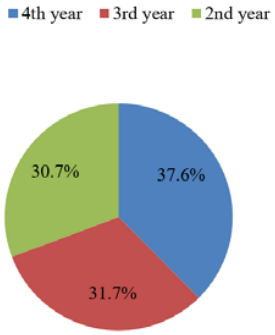


Fig. 1 Academic study level distribution of the study sample

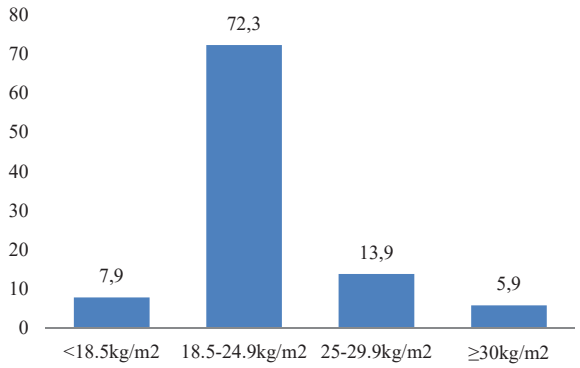


Fig. 2 Body mass index distribution among study sample

G. Association Between Practicing of Healthy Habits and BMI among the Study Sample

Although the result of current study showed no significant association between healthy habits practicing and BMI, Majority of overweight 10 (71.4%) and 5 (83.3%) of obese students were rarely doing exercise and two third 4 (66.7%) of obese students were monitoring their weight regularly with 3 (50%) of them drinking eight cups of water per day, and 10 (71.4%) of overweight and 5 (83.3%) obese students were sleeping less than eight hours per day (Table IV).

TABLE II
DIETARY HABITS DISTRIBUTION AMONG STUDY SAMPLE

Dietary habits		Frequency (*f*)	Percentage (%)
Eating breakfast	Daily	30	29.7
	2-3 week	29	28.7
	Rarely	42	41.6
Total		101	100
Eating lunch in the University residence	Always	79	78.2
	Sometimes	18	17.8
	Rarely	4	4
Total		101	100
Eating Dinner	Daily	88	87.1
	2-3 week	10	9.9
	Rarely	3	3
Total		101	100
Eating Rice	Daily	34	33.7
	2-3 week	15	14.9
	Rarely	52	51.5
Total		101	100
Eating cooked vegetables	Daily	24	23.8
	2-3 week	38	37.6
	Rarely	39	38.6
Total		101	100
Which meals eating	Eating at College		
	Breakfast	80	79.2
	Lunch	20	19.8
	Dinner	1	1
Total		101	100
Type of food eating	Sandwich	62	61.4
	Biscuits & sweets	29	28.7
	Crisps & fries	10	9.9
Total		101	100
Doing Exercise	Healthy Habits		
	Daily	7	6.9
	2-3 week	17	16.8
	Rarely	77	76.2
Total		101	100
Monitoring weight	Yes	49	48.5
	No	52	51.5
Total		101	100
Drinking Water	6-8 cups/day	52	51.5
	8 cups/day	39	38.6
	>8 cups/day	10	9.9
Total		101	100
Sleeping/day	< 8 hrs.	62	61.4
	8 hrs.	28	27.7
	>8 hrs.	11	10.9
Total		101	100

H. Association Between Socio-Demographic Status and BMI among the Study Sample

No significant association was found between some socio demographic factors and BMI among the study sample, however 9 (64.3%) of overweight and 5 (83.3%) of obese students being in age between 20-21 years old. In addition, 10 (71.4%) of overweight and 5 983.3%) of obese students being female and 6 (42.9%) of overweight and 4 (66.7%) of obese students were from the study level of 2nd year with 5 (83.3%) of obese were from middle socio-economic status. (Table V)

TABLE III
ASSOCIATION BETWEEN EATING HABITS AND BODY MASS INDEX AMONG STUDY SAMPLE

Items	BMI					
	<18.5 kg/m² F (%)	18.5-24.9 kg/m² F (%)	25-29.9 kg/m² F (%)	30> kg/m² F (%)	Total F (%)	P value
Dietary Habits						
Eating breakfast						
Daily	2 (25)	25 (34.2)	2 (14.3)	1 (16.7)	30 (29.7)	0.480
2-3 week	3 (37.5)	17 (23.3)	7 (50)	2 (33.3)	29 (28.7)	
Rarely	3 (37.5)	31 (42.5)	5 (35.7)	3 (50)	42 (41.6)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Eating lunch in the university residence						
Always	6(75)	57 (78.1)	10 (71.4)	6 (100)	79 (78.2)	0.030
sometime	0(0)	14 (19.2)	4(28.6)	0(0)	18 (17.8)	
Rarely	2 (25)	2 (2.7)	0 (0)	0 (0)	4 (4)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Eating dinner						
Daily	7 (87.5)	63 (86.3)	12 (85.7)	6 (100)	88 (87.1)	0.409
2-3 week	0 (0)	9 (12.3)	1 (7.1)	0 (0)	10 (9.9)	
Rarely	1 (12.5)	1 (1.4)	1 (7.1)	0 (0)	3 (3)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Eating rice						
Daily	7 (87.5)	53 (72.6)	11 (78.6)	5 (83.3)	76 (75.2)	0.765
2-3 week	0 (0)	16(21.9)	2 (14.3)	1 (16.7)	19 (18.8)	
Rarely	1 (12.5)	4 (5.5)	1 (7.1)	0 (0)	6(5.9)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Eating cooked vegetables						
Daily	1 (12.5)	20 (27.4)	2 (14.3)	2 (33.3)	25 (24.8)	0.752
2-3 week	3 (37.5)	27(37)	8 (57.1)	2 (33.3)	40 (39.6)	
Rarely	4 (50)	26(35.6)	4 (28.6)	2 (33.3)	36(35.6)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	

IV. DISCUSSION

The purpose of this study was to assess the diet and healthy habits and their association with body mass index (BMI) among nursing college students living at Kirkuk university residence and to find out the association between some demographical characteristics and BMI. The current study results represent that the prevalence of overweight and obesity was 19.8% among nursing college living in the university residence, and this result is in consistent with the result by Farrukh (2015) of a cross sectional study on 215 medical female students reported the prevalence of overweight and obesity 18% compared to 64% of normal weight [11]. while, it is inconsistent with an earlier findings by Norah M, (2010) who reported a 54% rate of overweight and obesity in the eastern region [12].

TABLE IV
ASSOCIATION BETWEEN HEALTHY HABITS AND BODY MASS INDEX AMONG STUDY SAMPLE

Items	BMI					
	<18.5 kg/m² F (%)	18.5-24.9 kg/m² F (%)	25-29.9 kg/m² F (%)	30> kg/m² F (%)	Total F (%)	P value
Healthy Habits						
Doing Exercise						
Daily	0 (0)	5 (6.8)	2 (14.3)	0 (0)	7 (6.9)	0.865
2-3 week	2 (25)	12 (16.4)	2 (14.3)	1 (16.7)	17 (16.8)	
Rarely	6 (75)	56 (76.7)	10 (71.4)	5 (83.3)	77 (76.2)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Monitoring weight						
Yes	2(25)	37 (50)	8 (57.1)	2 (33.3)	49(48.5)	0.411
No	6(75)	36 (49.3)	6(42.9)	4 (66.7)	52(51.5)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Drinking water/day						
6-8 cups /day	4 (50)	37 (50.7)	9 (64.3)	2 (33.3)	52 (51.5)	0.630
8 cups/day	2 (25)	30 (41.1)	4 (28.6)	3 (50)	39 (38.6)	
>8cups/day	2 (25)	6 (8.2)	1 (7.1)	1 (16.7)	10 (9.9)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Sleeping hours/day						
< 8 hrs.	5(62.5)	42(57.5)	10 (71.4)	5 (83.3)	62 (61.4)	0.867
8 hrs.	2 (25)	22(30.1)	3 (21.4)	1 (16.7)	28 (27.7)	
> 8 hrs.	1(12.5)	9 (12.3)	1 (7.1)	0 (0)	11(10.9)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	

TABLE V
ASSOCIATION BETWEEN SOME DEMOGRAPHICAL FACTORS AND BODY MASS INDEX AMONG STUDY SAMPLE

Socio-demographic factors	BMI					
	<18.5 kg/m² F (%)	18.5-24.9 kg/m² F (%)	25-29.9 kg/m² F (%)	30> kg/m² F (%)	Total F (%)	P value
Age/ years						
<20	2(25)	6 (8.2)	2 (14.3)	0 (0)	10 (9.9)	0.837
20-21	4(50)	45 (61.6)	9 (64.3)	5(83.3)	63(62.4)	
22-23	2 (25)	19 (26)	3 (21.4)	1 (16.7)	25(24.8)	
24>	0 (0)	3 (4.1)	0 (0)	0 (0)	3 (3)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Sex						
Male	5(62.5)	24 (32.9)	4 (28.6)	1 (16.7)	34(33.7)	0.268
Female	3(37.5)	49 (67.1)	10 (71.4)	5 (83.3)	67(66.3)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Academic study level at college						
2nd year	3 (37.5)	19 (26)	6 (42.9)	4 (66.7)	32 (31.7)	0.121
3rd year	4 (50)	23 (31.5)	2 (14.3)	2 (33.3)	31(30.7)	
4th year	1(12.5)	31 (42.5)	6 (42.9)	0 (0)	38 (37.6)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	
Socio-economic status						
High	4 (50)	26 (35.6)	5 (35.7)	0 (0)	35 (34.7)	0.452
Middle	3 (37.5)	33(45.2)	5 (35.7)	5 (83.3)	46 (45.5)	
Low	1 (12.5)	14 (19.2)	4 (28.6)	1 (16.7)	20(19.8)	
Total	8 (100)	73 (100)	14 (100)	6 (100)	101 (100)	

Body mass index was used to assess body weight gain status. Based on BMI classification of weight status, findings of this study indicated that the majority of the students were of normal weight, and the vast majority of female 71.4% were overweight and 83.3% were obese compared to overweight 28.6% and

16.7% obese. This result is inconsistent with a study by Yahia, N (2008) in a cross sectional study survey of 220 students from the Lebanese American University to examine their eating habits found that the prevalence of overweight and obesity was more common among male students compared to females (37.5% and 12.5% vs 13.6% and 3.2%) [13].

The frequency of food intake or skipping of meals is also related to weight gain and obesity [5]. Our study showed that the two fifth of the students have rarely breakfast with one third of them eating rice daily and more than two third of them eating cooked vegetables rarely and 2 to 3 times weekly. These habits need to be corrected using an educational program to promote healthy dietary habits among university students. A unique finding in the present work was the significant association between eating lunch at university residence and BMI. It is important to eat a variety of foods for good health. Healthy diet is the diet that included more fruits and vegetables and less fat [13].

Numerous studies reported that college students have inappropriate eating habits such as skipping meals, taking high-energy intake with high fat and sodium but low calcium and iron [14], [15]. According to a WHO report, there is a correlation between low Physical Activity (PA) on the one hand, and improper diet, excessive weight and obesity on the other [16]. Three quarters of the study participants were rarely doing exercise and around half of them were monitoring their weight with third of them having 6-8 cups water per day, in addition two third of them sleeping less than eight hours daily.

Nutritional knowledge is believed to play an important role in promoting healthier eating practices, and increased knowledge of dietary guidelines has been positively linked to more healthy eating practices amongst college students [5].

V. Conclusion

Although the result of the current study showed that three quarters of the study participants were healthy weight, the prevalence of overweight and obesity among the study sample was 19.8% with female students being more obese than males. Further studies are needed to identify BMI among residence students in other college and increasing the awareness of undergraduate students to healthy food habits.

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