

Factors Associated With Incidence Of Obesity And Overweight Among Students Of Medical Sciences

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Abstract

Background: overweight and obesity are the modern diseases of relatively high prevalence nowadays because of sedentary life style; and consider as a risk factors for the development of some important chronic diseases and that leading to increase morbidity and mortality. **Objective:** to study the prevalence and factors associated with overweight and obesity among students of medical campus of University of Kerbala in Holy Kerbala, Iraq.

Methods: an observational cross-sectional study was carried out in University of Kerbala (medical campus), Iraq. A total number of 300 students (male, female) between 18 -26 years of age were participated in this study from fives colleges of the Kerbala University. A questionnaire form was distributed to each participant include age, gender, weight, height, BMI, dietary habit, sport activity, family history of obesity, waist circumference; were measured and reported in the form then subjected for suitable statistical analysis.

1.1 Introduction:

Obesity, also called rotundity or fatness, excessive accumulation of body fat, is usually caused by the consumption of more calories than the body need. The excess calories are then stored as fat, or adipose tissues. Overweight, if temperate, is not necessarily obesity, particularly in muscular or large-boned individuals. Obesity was traditionally defined as an increase in body weight that was greater than 20 % of an individual's ideal body

Results: The overall prevalence of overweight and obesity was (62% and 83%) respectively. while prevalence of underweight and obesity was non-significant between male and female. Depending on their weight circumference, among male students, 1 student (2.4%) in college of pharmacy, and 2 students (7.7%) in nursing college were very high risk of obesity. For female students 17 were in very high risk of obesity.

Conclusion: the results obtained in this study show that the prevalence of obesity and overweight is not a big problem among the students in the medical campus in the University of Kerbala since the higher proportion (69.33%) are in the range of normal weight, this may be attributed to their scientific knowledge which is based on teaching information.

Keywords—Over weight; obesity; holy Kerbala; life style factor

weight. The weight related with the lowest risk of death, as determined by certain factors, such as age, height, and gender. Based on these factors, overweight could then be defined as a 15–20 % increase over the ideal body weight. Today the definitions of overweight and obesity are based primarily on measures of height and weight—not morbidity. Calorie, a unit of energy or heat, was originally defined as the amount of heat required at a pressure of 1 standard atmosphere to raise the temperature of 1 gram of water 1° Celuse. Since

1925 this calorie has been defined in terms of the joule [1]. According to the 2015-2020 Dietary Guidelines for Americans, women are likely to need between 1,600 and 2,400 calories a day, and men need from 2,000 to 3,000. However, this depends on their age, size, height, lifestyle, overall health, and activity level. For the human body to still alive, it needs energy. Around 20% of the energy we take in is used for brain metabolism. Most of the rest is used in basal metabolism, the energy we need when in a resting state, for functions such as blood circulation, digestion, and breathing. In the cold environment, we need more energy to maintain a constant body temperature, as our metabolism increases to produce more heat. In the warm environment, we need less energy. The efficient energy from respiration converts into physical or mechanical power depends on the type of food eaten, the type of physical energy, and if muscles are used aerobically or anaerobically. In other words, we need calories to fuel bodily functions, such as breathing and thinking, to preserve our posture, and to move around. This means that the weight gain depend firstly on caloric intake. Worldwide obesity has almost tripled since 1975. In 2016 more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese, 39% of adults aged 18 years and older were overweight in 2016, and 13percent were obese, overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2016 [2]. Modern western lifestyles are often blamed for the current obesity and associated chronic disease pandemics. This seems responsible as such problems, at a population level, only really began 3-4 decades ago. They are also not usually caused by any microbial agent and have occurred too quickly for genome changes to be a factor (although this does not prevent environmental influences on gene expression). The increased aging of the population is a consideration, but increased risk factors across all age groups limit aging as sole explanation [3].

1.2 Body mass index and Waist to Hip ratio

1.2.1 Body mass index (BMI)

A person's weight in kilograms divided by the square of height in meters could body mass index, it is an inexpensive and easy screening method for weight category—underweight, healthy weight, overweight, and obesity. BMI does not measure body fat directly, but BMI is moderately correlated with more direct measures of body fat, Furthermore, BMI appears to be as strongly correlated with various metabolic and

disease outcome as are these more direct measures of body fatness [3].

Table 1.1: Body-Weight categories.

BMI (Kg/m ²)	Weight status
Below 18.5	Underweight
18.5 – 24.9	Normal or Healthy Weight
25.0 – 29.9	Overweight
30.0 and Above	Obese

High BMI (e.g., 35 Kg/m²) also called morbid obesity, is very likely to have high body fat; a relatively high BMI can be the results of either high body fat or high lean body mass (muscle and bone). A trained healthcare provider should perform suitable health assessments to evaluate an individual's health status and risks. However, athletes may have a high BMI that because of increased muscularity rather than increased body fatness. In general, a person who has a high BMI is more likely to have body fatness and would be considered to be overweight or obese, but this may not apply to athletes. A trained healthcare provider should perform appropriate health assessments to evaluate an individual's health status and risks [4].

1.2.2 Waist to Hip ratio

The World Health Organization (WHO) Expert Consultation on Waist Circumference and Waist to Hip Ratio was held in Geneva, Switzerland on 8–11 December 2008. The consultation was organized by WHO's Department of Nutrition for Health and Development, in collaboration with the Department of Chronic Diseases and Health Promotion. It was opened by Dr. Ala Alwan, WHO Assistant Director-General for Non-communicable Diseases and Mental Health. It also highlighted the need for other indicators to complement the measurement of BMI, to identify individuals at increased risk of obesity-related morbidity due to accumulation of abdominal fat [2]. Waist-hip ratio (i.e. the waist circumference is divided by the hip circumference) was suggested as an additional measure of body fat distribution. The ratio can be measured more precisely than skin folds, and it provides an index of both subcutaneous and intra-abdominal adipose tissue. The suggestion for the use of proxy anthropometric indicators arose from a 12-year follow-up of middle-aged men, which showed that abdominal obesity (measured as waist-hip ratio) was associated with an increased risk of

myocardial infarction, stroke and premature death, whereas these diseases were not associated with measures of generalized obesity such as BMI. In women, BMI was associated with increased risk of these diseases; however, waist–hip ratio appeared to be a stronger independent risk factor than BMI. The waist to hip ratio estimates the fat distribution in the body and can affect your overall health [5].

Table 1.2: Relationship between WHR of male and health risks.

WHR for male	Health risks
Less than 0.85	Low risk
0.85_0.89	Moderate risk
0.90_0.95	High risk
More than or equal 0.95	Very high risk

While the standards slightly different for female

Table 1.3 Relationship between WHR of female and health risks

WHR for female	Health risks
Less than 0.75	Low risk
0.75_0.79	Moderate risk
0.80_0.86	High risk
More than or equal 0.86	Very high risk

1.3 Cause of obesity and obesity effect on health

1.3.1 Community Environment

People may make decisions based on their environment or community. For example, a person may not walk or bike to the market or to work because of a lack of sidewalks or safe bike roads. Community, home, childcare, school, health care, and workplace settings can influence daily behaviors. Therefore, it is important to create environments that make it easier to engage in physical activity and eat healthy foods [6].

1.3.2 Family History Health care practitioners routinely collect family health history to help them identify people at high risk of obesity-related diseases such as diabetes, cardiovascular diseases, and some forms of cancer. Family health history reflects the effects of shared genetics and environment among close relatives. Families cannot

change their genes, but they can encourage healthy eating habits and physical activity. Those changes can improve the health of family members—and improve the health history of the next generation.

1.3.3 Genetics effects

Genes have role in body responding to changes in its environment. Variants in several genes may contribute to obesity by increasing hunger and food intake. Rarely, a clear pattern of inherited obesity within a family is caused by a specific variant of a single gene (monogenic obesity). Most obesity, probably results from complex interactions across multiple genes and environmental factors that remain poorly understood (multifactorial obesity) [7].

1.3.4 Diseases and Drugs

Some illnesses may lead to obesity or weight gain such as Cushing's disease, and polycystic ovary syndrome. Drugs include steroids and some antidepressants may also cause weight gain. Research continues on the role of other factors in energy balance and weight gain such as chemical exposures and the role of the microbiome. People who have obesity, compared to those with a healthy weight, are at increased risk for many serious diseases and health conditions, including the following [7]:

- All-causes of death (mortality)
- High blood pressure (hypertension)
- High LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (Dyslipidemia)
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis (a breakdown of cartilage and bone within a joint)
- Sleep apnea and breathing problems
- Low quality of life
- Mental illness such as clinical depression, anxiety, and other mental disorders
- Body pain and difficulty with physical functioning
- Many types of cancers

1.4 Obesity and overweight treatment

The most of drugs approved to treat obesity have short-term indications for usage. However, some of the newer medications have been approved for long-term weight management. The older medications

approved for short-term use are the anorexiant phentermine and diethylpropion. There is a much bigger list of anorexiant used off-label for weight loss. Medication used to treat obesity:

1.4.1 ANOREXIANTS (APPETITE SUPPRESSANTS)

Phentermine and diethylpropion are considered appetite suppressants. Phentermine exerts its pharmacologic action by increasing the release of norepinephrine and dopamine from the nerve terminals and by inhibiting reuptake of these neurotransmitters, thereby increasing levels of neurotransmitters in the brain. The increase in norepinephrine signals a "fight-or-flight" response by the body, which, in turn, decreases appetite. Diethylpropion has similar effects on norepinephrine. Tolerance to the weight loss effect of these agents increases within weeks, and weight loss typically plateaus. An increase in the dosage generally does not result in further weight loss, and discontinuation of the drug is usually recommended once the plateau is reached.

1.4.2 LIPASE INHIBITORS

Orlistat is currently the only available agent in class of Anti-obesity drugs known as lipase inhibitors. It is indicated for weight loss or weight maintenance. The clinical utility of orlistat is limited by gastrointestinal adverse effects. Orlistat is a pentanoic acid ester that inhibits gastric and pancreatic lipases, so decreasing the breakdown of dietary fat into smaller molecules that can be absorbed. Administration of orlistat decreases fat absorption by about 30percent. The loss of calories from decreased absorption of fat is the main cause of weight loss. However, adverse gastrointestinal effects associated with the drug may also contribute to an overall decreased intake of food.

1.4.3 SEROTONIN AGONISTS

Lorcaserin a newer serotonin agonist, with selectivity for the 2C serotonin receptor (5-HT_{2C}). It is used for chronic weight management. Previous serotonin agonists used for weight loss were pulled from the market after an increase in potentially fatal adverse effects, including valvular heart disease. It is believed

that valvulopathy, which may lead to pulmonary hypertension, is linked to 5-HT_{2B} receptor [6].

1.4.4 Combination Drugs

The combination of phentermine and topiramate has been approved for long-term use in the treatment of obesity. In primary studies of the anticonvulsant topiramate, it was observed that patients lost weight while taking the medication. This encourages further investigation into the use of topiramate for weight loss in obese individuals. The stimulant phentermine was added to counteract the sedation and promote additional weight loss. Because of the sedating effects of topiramate, the phentermine/topiramate combination is dosed in steps, escalating the dose every 2 weeks, depending on the response. If a patient does not achieve a 5% weight loss after 12 weeks on the highest dose of this medication, then it should be discontinued. It is also important to note that this medication should not be stopped abruptly as seizures may be precipitated.

Bariatric surgery, Bariatric surgical procedures cause weight loss by trapping the amount of food the stomach can hold, causing malabsorption of nutrients, or by a combination of both gastric restriction and malabsorption. Bariatric procedures also often cause hormonal changes. Most surgeries of weight loss today are performed using minimally invasive techniques (laparoscopic surgery). The most common bariatric surgery procedures are gastric bypass, sleeve gastrectomy, adjustable gastric band, and biliopancreatic diversion with duodenal switch. Each surgery has its own advantages and disadvantages [7].

Aims of the Study:

- 1 – To investigate the prevalence of overweight and obesity among students in medical campus in University of Kerbala.
- 2- To identify some associated factors with overweight and obesity among students in medical campus in University of Kerbala.

Methodology

This is a cross-sectional, university based study which was conducted at the University of Kerbala in Holy Kerbala governorate in Iraq during the second semester of the academic year 2019-2020, from 1st October 2019 to February 2020; Approval of the study protocol and written consent was obtained from the authority of the university prior to data collection. The study population included all the students in the medical campus in the University of. Data collection was done through direct interview using a special questionnaire designed for this purpose (Appendix A). The questionnaire included personal and sociodemographic information such as age, gender, marital status, educational level, and occupation. It also included questions on smoking, dietary habits and performing physical exercisen [8] . Family history of obesity, monthly family income also taken. Weight, height and waist to hip ratio were to be measured for each student Data collection took place in two steps. The first step was to fill out the questionnaire and the second step was to perform the anthropometric measurements. The students were interviewed outside the classroom; clarifications and basic orientation on the objectives of the study were given beforehand and explanation of the rationale to take weight and length and WC to the students. The students were free to decide whether they would participate or not; they were assured of the confidentiality of their responses, briefed on the importance of giving an honest response, and informed verbal consent was taken from each student. Assistance was provided for respondents who requested clarification on any of the questions. To enhance honest disclosure of information, each participant had privacy in responding to the questionnaire .To evaluate overweight and obesity, BMI was calculated from the height and weight data using the standard formula: $BMI = \text{weight (kg)} / \text{height (m)}^2$ Weight status was classified according to “the International Classification of adult underweight, overweight and obesity according to BMI” into four classes (underweight (BMI ≤ 18.5), normal weight (BMI between 18.5 – 24.9), overweight (BMI between 25–29.9), and obese (BMI ≥ 30 -39) . BMI measurements are the same for both sexes and for all ages of adults .BMI can be a good starting point in assessing weight, however it should be considered more of a rough guide, rather than a way to determine if a person has obesity, as body composition and distribution of body fat in people with similar BMIs can vary widely. A person’s weight in kilograms divided by the square of height in meters

could body mass index, it is an inexpensive and easy screening method for weight category—underweight, healthy weight, overweight, and obesity. BMI does not measure body fat directly [2].

Table 2.1: Body mass index -Weight categories.

BMI (Kg/m ²)	Weight status
Below 18.5	Underweight
18.5 – 24.9	Normal or Healthy Weight
25.0 – 29.9	Overweight
30.0 and Above	Obese

The equation below demonstrate the way for calculating Body mass index

Body mass index : $\text{Weight (Kg)} / \text{square of height (meter)}$

Waist-to-hip ratio, also known as Abbreviated (WHR), is the circumference of the waist divided by the circumference of the hips. The waist-to-hip ratio (WHR) is a fast scale of fat distribution that may help indicate an individual’s general health. People who carry more weight around their middle than their hips may be at a higher risk of developing certain health conditions. a person needs to measure both the circumference of their waist and their hips. Circumference means the distance around something. To measure the circumference of their waist, a person should stand up straight and breathe out, then measure their waist just above the belly button with a tape measure. This should be where the waist is smallest. Be careful not to pull the tape measure too tight, and remember to record the waist measurement before moving on to the hips. To measure the circumference of their hips, stand up straight and wrap a tape measure around the widest part of the hips. Take the measurement where the ends of the tape measure overlap, again do not pull it too tight. To calculate the WHR, divide the first measurement (waist circumference) by the second measurement (hip circumference). Measurements can be recorded in either centimeters (cm) or inches (in) without affecting the ratio. Now there's a simple sum (even easier if you use our gadget): take the waist measurement and divide it by the hip measurement. If you're doing this by hand, make sure your units are the same for both measurements. You'll end up with a number that helps you determine which body shape category you fit into. The measurement of (WHR) demonstrated below for male and female [5]:

Waist to hip ratio: waist measurement (inch) / hip measurement (inch)

Table 2.2: Relationship between WHR of male and health risks

WHR for male	Health risks
Less than 0.85	Low risk
0.85_0.89	Moderate risk
0.90_0.95	High risk
More than or equal 0.95	Very high risk

Table 2.3 Relationship between WHR of female and health risks

WHR for female	Health risks
Less than 0.75	Low risk
0.75_0.79	Moderate risk
0.80_0.86	High risk
More than or equal 0.86	Very high risk

Statistical analysis:

Table 3.1 Details of participated students

Colleges	N	Age(year)	Male/female
Pharmacy	85	19_24	42/43
Dentistry	81	19_25	50/31
Human medicine	46	19_24	7/39
Nursing	47	19-23	29/18
Applied medical science	41	19-22	8/33
Total	300		125/175

Descriptive statics was done using software package, results represent percent of total, the way for calculating percent of total in our project: sum the number of student for each choice for each question and by Proportion and fit calculate the percentage for each choice by below equation:

Number off total students (300)
100%

Number of students who choses specific choice X%

And calculate the total percentage for each choice for each question.

Results

3.1 Demographic data

A total number of 300 students were participated in this study; from five colleges in the University of Kerbala, from faculty of pharmacy 85 students, faculty of dentistry 81 students, from colleges of nursing 47 students, from faculty of human medicine 46 students and from applied medical colleges 41 students, the female participated 175, the male participated 125; the demographic data of study participants are summarized in table (1)

3.2 BMI and WHR among students of medical campus

3.2.1 Body mass index

The body mass index was collected to all participated ,accordingly to colleges 7.4%(23) of total percentage of student underweight , 66.66%(200) was in the normal weight , 19.3%(58) of students was overweight and 6.3%(19) of students was obese .

3.2.2 Waist - Hip ratio for male

In all male of five medical college the total percentage of student less than 0.85 was 19.33 % (58) -17% (51) between the rang 0.85-0.89 - 4.33 % (13) was between 0.90-0.95 and 1%(3) more than or equal 0.95

3.2.3 Waist - Hip ratio of female

The total percentage of female was less than 0.75 (10.33%), 26.33% (79) between the range 0.75-0.97, 16% (48) between the rang 0.80-0.86 and 5.66% (17) more than or equal 0.86.

Table 3.2 BMI and Waist- Hip ratio percentage

Variable	Type	Pharmac y	Dentistry	Medicine	Nursing	Applied	Total
Body mass index	less than 18.5	8.20%(7)	9.90%(8)	2.2%(1)	6.3% (3)	9.8%(4)	7.6%(23)
	18.5_24.9	62.4%(53)	65.40%(53)	82.6%(38)	64.6(31)	63.4%(26)	66.66% (200)
	25_29.9	24.70%(21)	19.80%(16)	10.9%(5)	18.8%(9)	17.1%(7)	19.3%(58)
	30_34.9	4.7%(4)	4.90%(4)	4.3%(2)	10.4%(5)	9.8%(4)	6.3%(19)
Waist to hip ratio for male	less than 0.85	57.10%(24)	52.70%(27)	57.10 %(4)	7.7%(2)	12.5%(1)	19.3%(58)
	0.85_0.89	33.3%(14)	36.40%(18)	42.9%(3)	69.9%(11)	62.5%(5)	19.33% (51)
	0.90_0.95	9.60%3)	10.90%(5)	0%		15.4(3)	25%(2)
	More than or equal 0.95	2.4%(1)	0%	0%	7.7%(2)	0%	1%(3)
Waist to hip ratio for female	less than 0.75	18.60%(8)	21.1%(6)	18.4%(7)	17.5%(6)	12.8(4)	10.33% (31)
	0.75_0.79	41.90%(18)	36.8%(13)	50%(20)	37.5%(11)	48.7%(17)	26.33% (79)
	0.80_0.86	30.20%(13)	31.6%(10)	15.8%(6)	45%(13)	23.1%(7)	16%(48)
	more than or equal 0.86	9.30%(4)	10.5%(2)	15.8%(6)	0%	15.4%(5)	5.66%(17)

Results represented as percent of total

3.3 Knowledge about eating habits

The total percentage of student was underweight 15.33%(46) , over weight 13.33%(40) ,normal weight 69.33%(208) and obese 2%(6).

The total percentage of student eating healthy food was 31.66% (95), doing more exercise 24% (72) and nothing 44.33% (133).

The total percentage of student was eating between main meal 69.33% (208) and don't eat 30.66% (92).

The total percentage of student eating fast food every day 22.33%(67),a few time a week 43.33%(130) a few time a month 22%(66) and rarely or never 12.33%(37).

The total percentage of student was eating fruit more than three time a week 57.66% (173),twice a week 24.33%(73) and once time a week 18%(54).

The total percentage of student doing exercise zero time each week 48% (144) ,once or twice time 39.66% (119)and three or more times 12.33%(37).

Table 3.3 knowledge about eating habits

Questions	Type	Pharmacy	Dentistry	Medicine	Nursing	Applied Medical Sciences	Total
What do you consider yourself?	Under Weight	18.80% (16)	11.10% (5)	17.70% (14)	12.50% (6)	12.2% (5)	15.33% (46)
	Over weight	16.50% (14)	8.90% (4)	11.40% (9)	14.60% (7)	14.6% (6)	13.33% (40)
	Normal weight	63.50% (54)	73.30% (34)	70.90% (58)	70.80% (34)	70.7% (29)	69.33% (208)
	Obese	1.2% (1)	6% (3)	2.10% (0)	2.1% (1)	2.4% (1)	2% (6)
Are you currently doing anything to improve your health or weight?	Eating healthier food	30.60% (25)	24.40% (11)	38% (29)	39.60% (19)	26.8% (11)	31.66% (95)
	Doing more exercise	24.70% (21)	20% (9)	24% (19)	27.10% (13)	24.4% (10)	24% (72)
	Nothing	44.70% (36)	55.60% (24)	38.70% (32)	33.30% (16)	48.8% (20)	44.33% (133)
Do you eat between main meals?	Yes	67.10% (56)	64.40% (30)	67.50% (54)	83.30% (40)	68.3% (28)	69.33% (208)
	No	23.90% (28)	35.60% (16)	32.50% (27)	16.70% (8)	31.7% (13)	30.66% (92)
How often do you eat fast food?	Everyday	21.20% (18)	20% (9)	23.80% (19)	18.80% (9)	29.3% (12)	22.33% (67)
	A few time a week	48.20% (41)	35.60% (17)	43.80% (34)	45.80% (22)	39% (16)	43.33% (130)
	A few time a month	20% (17)	33.30% (15)	18.89% (16)	20.80% (10)	19.5% (8)	22% (66)
	Rarely or never	10.60% (9)	11.10% (5)	13.70% (11)	14.60% (7)	12.2% (5)	12.33% (37)
How often do you eat fruit?	More than three times a week	60% (50)	45.7% (21)	53.80% (43)	72.90% (35)	58.5% (24)	57.66% (173)
	Twice a Week	20% (17)	32.6% (15)	23.70% (19)	18.80% (9)	31.7% (13)	24.33% (73)
	Once a week	20% (17)	21.7% (10)	22.50% (19)	6.30% (4)	9.8% (4)	18% (54)
How many times you do exercise each week?	Zero times	52.90% (44)	62.20% (28)	43.80% (36)	41.70% (20)	39% (16)	48% (144)
	Once or Twice	29.40% (25)	31.10% (15)	42.50% (34)	43.80% (21)	58.5% (24)	39.66% (119)
	Three or more times	17.60% (15)	6.5% (3)	13.70% (11)	14.60% (7)	2.4% (1)	12.33% (37)

3.4 The percent Of quantity of drinking caffeinated liquids during the day , smoking , hours of sleeping during the night ,and hours of sleeping during the day among the medical campus in the University of Kerbala .

63.33(190) of students drinking coffee or tea one time daily, 19.33% (58) drinking coffee or tea two times daily ,10%(30) drinking coffee or tea three

times daily and 7.33%(22)drinking coffee or tea more than three times daily. 28.66% (86) of students do smoke and 71.33% (214) don't smoke. 38% (114) of students are sleeping six hours during the night, 29.33% (88) are sleeping seven hours and 32.66%(98) are sleeping eat hours or more during the night. 66.66% (200) of students sleeping during the day and 33.33% (100) don't sleep during the day.

Table 3.4: The nature of health concern among the medical campus in the University of Kerbala

Questions	Options	Pharmacy	Medicine	Dentistry	Nursing	Applied Medical Sciences	Total
How many times do you drink coffee, tea during the day?	One time daily	67.1%(57)	56.5%(26)	57.50%(47)	64.60%(31)	70.7%(29)	63.33% (190)
	Two time daily	16.5%(14)	34.8%(16)	20%(16)	12.50%(6)	17.1%(6)	19.33% (58)
	Three time daily	7.1%(6)	6.7%(3)	13.80%(11)	14.6%(7)	7.3%(3)	10% (30)
	More	9.4%(8)	2.2%(1)	8.80%(7)	8.30%(4)	4.9%(2)	7.33% (22)
Do you smoke?	Yes	23.50%(20)	88.90%(41)	23.80%(18)	8.30%(4)	7.2%(3)	28.66% (86)
	No	76.50%(65)	11.10%(5)	76.30%(62)	91.70%(44)	92.7%(38)	71.33% (214)
How many hours do you sleep during the night?	Six hours a day	35.50%(30)	42.20%(19)	42.50%(32)	39.60%(19)	31.7%(14)	38% (114)
	Seven hours a day	34.10%(29)	31.10%(14)	25%(20)	25% (12)	31.7% (13)	29.33% (88)
	Eight hours or more a day	30.60% (26)	26.70% (13)	32.50% (27)	35.40% (17)	36.6% (15)	32.66% (98)
Do you sleeping during the day	Yes	69.40% (59)	60% (28)	67.50% (54)	66.70% (32)	65.9% (27)	66.66% (200)
	No	30.60%(26)	40.%(18)	32.50%(27)	33.30%(16)	34.1%(13)	33.33% (100)

3.5 The percent of students that have diseases and on medications with family history of obesity among the medical campus in the University of Kerbala.

35% (105) of students have someone in their families suffering from obesity and 65%(195)don't have. 11%(33) of students are suffering from disease and 89%(267) don't suffer from any disease .

10%(30)of students are currently on medications and 90%(270) don't take medications currently.

The high percent of student don't suffering from obesity and chronic diseases and don't take any medication continuously, that mean perfect result

Table 3.5: The prevalence of chronic disease among the medical campus in the University of Kerbala.

Questions	Options	Pharmacy	Medicine	Dentistry	Nursing	Applied Medical Sciences	Total
Is there someone in your family suffering from obesity?	Yes	29.40% (25)	35.60%(16)	43%(35)	29.20%(14)	36.6%(15)	35% (105)
	No	70.60% (60)	64.40%(30)	57%(46)	70.80%(34)	63.4%(25)	65% (195)
Do you suffering from any disease ?	Yes	5.9% (5)	15.2%(7)	7.4%(6)	28.8%(10)	12.2%(5)	11% (33)
	No	94.1% (80)	84.8%(39)	92.6%(74)	79.2%(38)	87.8%(36)	89% (267)
Are you currently on any medication?	Yes	3.5% (3)	3.4%(2)	9.9%(8)	20.8%(10)	17.1%(7)	10% (30)
	No	96.5% (82)	95.7%(44)	90.1%(73)	79.2.%(38)	82.9%(33)	90% (270)

3.6 The eating habits patterns

60.66% (182) of students are watching TV when they eat and 39.33% (118) don't watch TV when they eat.

82.66% (248) of students are eating with family and 17.33% (52) are eating alone. 61.66% (185) of students are eating slowly and 38.33% (115) are eating fast.

Table 3.6: Eating style among the medical campus in the University of Kerbala.

Questions	Option	Pharmacy	Medicine	Dentistry	Nursing	Applied medical sciences	Total
Do you watch TV when you eat or do something?	Yes	72.90% (62)	60% (28)	75.50% (46)	58.30% (28)	43.9% (18)	60.66% (182)
	No	27.10% (23)	40% (18)	42.50% (34)	41.70% (20)	56.1% (23)	39.33% (118)
Do you eat with family or alone?	Family	78.60% (66)	84% (38)	80% (64)	83.70% (40)	97.6% (40)	82.66% (248)
	Alone	21.40% (19)	15% (7)	20% (17)	16.70% (8)	2.4% (1)	17.33% (52)
Do you eat slowly or fast?	Slowly	56.50% (48)	64.40% (30)	58.80% (47)	68.80% (33)	65.9% (27)	61.66% (185)
	Fast	43.70% (37)	35.60% (16)	41.30% (33)	31.30% (15)	34.1% (14)	38.33% (115)

Discussion

The purpose of this observational study was to determine the prevalence of overweight, obesity, also life style and eating habits of the Iraqi medical campus students in the University of Kerbala. Body mass index and waist to hip ratio used to assess weight status. A total number of students 300 were participated in this study from five colleges pharmacy 85 students, dentistry 81 students, Human medicine college 46 students, Nursing college 48 and from applied medical science 43 students.

Knowledge

The BMI of the majority of participated students were between 18.5_24.9 (66.66%) this clarify that majority of medical campus students in the range of normal weight due to the knowledge about obesity and overweight effect on health, while the minority were between 30_34.9 (6.3%) because of their sedentary life style and bad eating habits, and the range between 25_25.9(19.3%) clarify overweight it is almost low and this results may be due to time for studying almost more than other colleges and the underweight students they were(7.6%), compare with a study done in 2013 in the medical campus of the university of Kerbala (Al-Ghabban, 2013). The results was approximate to our results, the majority of students where in the normal weight (65.9%), for overweight and obesity

respectively (22.9%) and (5.9%) and underweight students (5.6%). BMI is a measure of size – not of health. Health is not determined by the amount of body fat alone but also by where the fat is located. While, when the location of fat inside your abdomen (belly fat) is an important risk factor for hypertension, heart disease, diabetes, fatty liver and other metabolic problems, the hips and thighs fat is less related with health problems. This is why some researchers proposed measuring waist circumference to determine obesity related health risks. In Caucasians, a waist circumference of more than 40 inches in males and more than 35 inches in females proposed that an individual is at a higher risk of developing metabolic problems associated to obesity [9].

The higher proportion were less than 0.85 (19.33%), while who were between 0.85_0.89(17%), while who were between 0.90_0.95 and more than or equal 0.95 respectively (4.33%),(1%), while similar study among Turkish medical students [10], the higher proportion were 0.80_0.85 similar to the three first colleges because these two countries share a lot if things like eating habits.

The higher proportion were 0.75_0.79 (26.33%) while who were less than 0.75(10.33%) And who were 0.80_0.86 and more than or equal 0.86 respectively (16%) (5.66%) in comparisons with Turkish medical students, the higher proportion were 0.75_0.79

almost similar to our results because these two countries share a lot of things like eating habits and the Society's view of the ideal body.

Most of students consider themselves in the normal weight (69.33%) , while students who are consider themselves underweight (15.33%) ,and the students who are consider themselves overweight and obese respectively (13.33) ,(2%), These results are almost compatible with body mass index of medical campus students. In comparison with a study in the university of Karbala in medical campus students also the majority consider themselves normal weight (65.9%) while underweight (5.6%) and the students who are consider themselves overweight and obese respectively (22.9%) ,(5.6%). These results demonstrate the medical community of the University of Karbala has not changed much over the past seven years in terms of weight due to the converged lifestyle in the same university. In the university of Erbil in 2019 a close study completed on adults of Erbil [11] , most of adults were obese (40.8%) while overweight adults (33.4%) ,and adults who were consider themselves in the normal weight (25.6%) finally who were consider themselves underweight (0.2%), Because this study is based on a different age group, where the participating ages are from the twenties to the sixties, where it shows the effect of age on weight.

More than half of students their families have not obesity (57%_70%) while students families who have one or more members have obesity (29%_43%) and these results demonstrate a high control on their life style, compare to a study on medicine teachers in university of kufa [12] who have one or more family member suffering from obesity (59.4%) while who have not any family member suffering from obesity (40.6%) . These results were taken from the same society, which is the Iraqi society, and therefore the results appeared close.

Prevalence to half they do not doing anything to improve their health (44.33%) while students who are eating healthier food or doing exercise were respectively (31.66%) ,(24%) these results clarify. They are almost always concerned with their health and maintaining their weight, given their wide knowledge of the harmful effects of obesity.

The majority of students eat between main meals (69.33%) while students who are not eating between main meals (30.66%) ,In comparisons with study done among medical students at king Abdul-Aziz university , Jeddah , Saudi Arabia [13] ,The students

who are eating snacks between main meals (81.8%) while students who are not eating snacks between main meals (18.2%), These results are close due to the similar lifestyle , Eating a lot of meals between the main meals causes weight gain, obesity, and great harm to health(Snacking has become a popular habit among children and teenagers. At the same time, overweight and obesity have reached huge proportions, affecting young individuals, particularly in Italy, where the childhood obesity is higher than in most European countries [1]. Snacking has been considered one of the main contributors to overweight because of the increased consumption of energy-dense, high-sugar, high-fat foods. Other studies have, however, failed to establish a correlation between snacking and overweight), in comparisons with a study in university of Kerbala in 2013 [8] the students who were eating meals between main meals (60%) while who are not (40%) and these results almost similar to the upper two results.

Students usually choose fast food due to its ease of access, taste, suitability for their lifestyle and low costs. This study reveals that the proportion of medical students who consumed fast food every day was (22.33%) and (43.33%)students who consumed fast food a few time a week ,(22%)percent of students who costumed fast food a-few times a-month and (12.33%)percent of students who rarely or never consume fast food .So the majority of students consumes fast food a few time a week which is unhealthy eating habit although medical students should know that Fast food, although it is convenient and a tasty addition to a diet, can have serious health and social effects. Regular eating of fast food can increase the risk of weight gain and obesity in adolescents and adults having energy density with presence of high levels of fat and sugar of the meal, corresponding low level of fiber and protein apparently [14],and the lowest percentage of students who rarely or never consume fast food that indicate only(10%_14%)of them eating healthier food .In Saudi Arabia a study of medical students showed that 37% of students ate fried food one to two times per week, and 37.8% eat it three to four times per week which is relative to our percentage . A Malaysian study revealed that 73.5% of medical students consumed fast food more than two times per week which it's much higher than our percentage [15].

This study revealed that the proportion of medical students who consumed fruits more than three times

a week was (57.66%) And (24.33%) consumed fruit twice a week (18%) consumed fruit once a week. The majority of students consume fruits more than 3 times a-week and the lowest percentage of students consume fruits once a week this percent is good if it compared to other countries. For fruit intake among Saudi university medical students who consumed vegetables and fruits daily was 20.4% and 11.9%, respectively. Research in other countries have reported that 26.3% of Bahrain students ate five servings of fruits and vegetables daily, while 20% of Pakistani female university students ate two servings of fruits and vegetables daily. Western countries such as the United States, Germany, and Great Britain revealed between 66% and 95% of university students did not meet recommendations for daily vegetable and fruit consumption. The World Health Organization recommendations are that adults should eat a minimum of five servings, or 4000 g, of vegetables and fruits daily. the consumption of healthier diets recommend eating three to five servings of vegetables and two to four servings of fruits on a daily basis .Adequate consumption of vegetables and fruits protects against chronic diseases like cardiovascular diseases, obesity, and some cancer types [14].

This study revealed that the proportion of medical students who watch TV when they eat was (60.66%) and the proportion of students who don't watch TV when they eat was (39.33%). So the majority of students watch TV when they eat food. Australian study shows that 41 % of respondents indicated that they usually watch commercial television for <1h/d. 29% estimated doing this activity for 2h/d, while a further 30 % reported watching commercial television for >3 h/d. Respondents who watched commercial television for >3 h/d were significantly more likely to eat fast food for dinner at least once weekly compared with those who watched for <1 h/d.(11) Many studies regarding a positive correlation between the time of watching television, and risk of developing obesity were also carried out in Poland [16]. So our percentage is relative to other countries percentage .watching television acts as a sedentary replacement for physical activity; food advertisements for nutrient- poor, high-calorie foods stimulate food intake; and television viewing is associated with "mindless" eating [17].

Increased caloric intake and reduced energy expenditure are the most commonly proposed mechanisms for explaining the relationship between television viewing time and health outcomes.

Increased snacking has been associated with high levels of television viewing time and increased adiposity [16].

This study revealed that the proportion of medical students who eat with family was (82.66%) and the proportion of students who eat alone was (17.33%). So the majority of students eat with their families .This percentage is higher than Saudi Arabia medical students who ate their meals with family and friends on a daily basis (44.2%), which was slightly higher than that reported for Lebanese university students (42.7%),but lower than what has been reported for Malaysian medical students (81.80%) [18].

There is no study shows that eating with family causes obesity ,some studies shows that eating with family is healthier Adolescents/young adults in United States reporting high family functioning and more good relationships with their families reported better weight- related behaviors . The family environment has an essential role in the establishment of dietary, physical activity, eating habits, and other weight-related behaviors among youth [19].

This study revealed that the proportion of medical students who eat slowly was (61.66%) and the proportion of students who eat fast was (38.33%).the majority of students eat slowly. In Japanese study on college students show that about of 380 normal weight students are eating quickly and 65.8% of 25 over weight eating slowly, there is a study on women in japan were few very slow and very fast eaters— only 5% for both groups—and the rate of eating explained only 7% of the observed variation in BMI. only two epidemiological studies have previously examined the association between rate of eating and obesity, with both reporting a positive association If fast eating was recognized as an important risk factor for obesity, obese subjects would tend to eat foods more slowly and reported rate of eating would be confounded by BMI status. However, 'eating slower' was not ranked among 20 major methods of diet This indicates that reduction in eating rate as a weight-control measure is unlikely to be a serious source of bias in this population. American study shows that eating quality may increase risk of pre overweight, in our study majority of students eat slowly witch is a-good behavior for health.

It has been found that half of students are drinking coffee one times daily (63.33%), students who are drink coffee or tea two times daily are (19.33%) ,students who are drinking coffee or tea three daily(10%) and students who are drinking coffee or tea

more than three times daily (7.33%) and these results opposite our expectation because medical students need a suitable amount of caffeine [20].

The majority of medical campus students are non-smoker (71.33%). While the minority of medical campus students are smoker (28.66%). The idea that cigarette smoking is helpful in controlling body weight has been part of popular culture for many years. Cigarette advertisements from the 1930s suggested that women should "reach for a cigarette instead of a sweet." For many smokers, the anticipation of weight gain can hinder smoking cessation success. Most health-care providers would agree that the decrease in morbidity and mortality associated with smoking cessation far outweighs the health risks associated with post-cessation weight gain. Nevertheless, weight gain can reduce some of the health benefits of quitting smoking. For example, weight gain after smoking cessation contributes to an increased risk of type 2 diabetes⁴ and hypertension⁵ and also reduces the improvement in lung function conferred by quitting smoking.⁶ Overweight and obesity peak at 45–64 years of age. This is also a period when smoking cessation is more likely to occur. Of the population ≥ 50 years of age, 44% of overweight men and 48% of obese men are former smokers, whereas 27% of overweight women and 27% of obese women are former smokers. Optimizing the health benefits of smoking cessation requires greater understanding of the behavioral and biological relationships between smoking and dietary habits in order to prevent weight gain after quitting smoking saved message [21]. In comparison with university of Erbil , most student are nonsmokers (92.5%) While smokers students (7.5%) . The study in the university of king Abdul-Aziz, Jeddah, Saudi Arabia on medical campus students ,the non-smoker students (76.4%) while smoker students (23.5%), similar our results because they are in same education level .

This study revealed that the proportion of medical students who exercise three or more times a week was (12.33%),proportion of students who exercise once or twice a week(39.33%) and percentage of students who never do exercise was(48%) This study show that majority of students don't do exercise although it is very important to protect themselves from cardiovascular diseases, control of weight and still healthy .in comparison to a study done in Erbil on adults the percentage of adults who exercise was(5.7%) and adults who don't exercise

was(92.7%)(10)which is very high percentage and indicate risk of obesity and other complications [11] .

The majority of students sleeping at night 6 hours or less (38%)the students who are sleeping 8 hours or more (32.66%) , the minority of students who are sleeping 7 hours (29.33%) and this not enough time for a perfect sleeping because of long studying time and usage of Internet and electronic devices . The ideal duration of sleep has been a matter of argument but recent consensus of the American Academy of Sleep Medicine defines short sleep duration as <8–10 hours and <7 hours per day in adolescents and adults aged 18–60 years respectively, considering the potential risks in association with the development of cardio metabolic disease and death, more than one-third of adults were short sleepers, particularly prevalent in those who were young, obese (body mass index [BMI] ≥ 30 kg/m²) [22].

Results of this study showed that most of students are taking a nap during the day(66.66%) while students who are not sleeping during the day (33.33%)because of Exhaustion studying in college , According to the study published in 2008, researcher Sarah Mednick of the University of California, who is also the author of "Take a nap! Change your life," and her colleagues make a comparison between the benefits of 200 mg of caffeine (the equivalent of a cup of coffee) and a nap of 60 to 90 minutes during the day for the different memory tasks. In comparison with a study on medical students in Saudi medical journal, the students who are taking a nap during the day (83%) while students who are not sleeping during the day (17%) These results are slightly different from our study [23].

The majority of students don't have chronic disease (89%) while medical campus students who have chronic disease hypertension, asthma, diabetic and rheumatoid arthritis (11%) these results demonstrate good students health, compare to a study on medicine teachers in university of kufa who have chronic disease (40.6%) while teachers who don't have chronic disease (59.4%) due to age differences and age effect on health between students and teachers [12].

The majority of students do not take any chronic medication (90%) while students who are taking medication (10%) these results clarify good students health, compare to a study in king Abdul-Aziz university, Jeddah, Saudi Arabia students, most students are not taking any medication (86.2%) while

students on medication (13.8%) and these results are close to our results due to similarity life style between the students of these two colleges [13].

In conclusion, the results obtained in this study show that the prevalence of obesity and overweight is not a big problem among the students in the medical campus in the university of Kerbala since the higher proportion was (69.33%) in the range of normal weight, this may be attributed to their scientific knowledge which is based on teaching information .

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