Sleep Patterns in Overweight/Obese Adults in Baghdad City

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Abstract

Background: Abnormal sleep patterns are health challenge facing the Iraqi community and related to modernized behavioral changes.

Aim of Study: To identify the prevalence of abnormal sleep patterns among overweight/obese adults in Baghdad city.

Patients and Method: A descriptive cross sectional survey carried out in two Nutrition Clinics in Baghdad. During six months including 250 overweight/obese adults. The short sleep duration was defined as <7 hours/ day and late sleep onset was defined as sleeping at 11 o'clock pm and later.

Results: Mean sleep duration was (7.23 hours). Sleep onset was in 66.8% of participants. Mean body mass index (BMI) was significantly higher in participants with short sleep duration ($p<0.001$). Short sleep duration was associated with younger age, male gender and negative medical history, while significant risk factors for late sleep onset are younger age, students and smoking.

Conclusions: The prevalence of abnormal sleep patterns among overweight/obese was high. There is a strong link between short sleep duration and higher BMI.

Keywords: *Overweight, Obesity, Sleep duration, Sleep onset.*

Introduction

Obesity is a global public health problem[1,2]. In Iraq, about one third of population are obese[3, 4]. Obesity in Iraq is commonly related to older age, female gender, illiteracy, unemployment and physical inactivity[5]. Sleep is main health need and required for many body functions. Many authors referred to adverse effects of sleep deprivation on health (physically and mentally) and affect the cognitive processes[6]. Lack of sleep exist when the human being biological need of sleep is not enough. Many definitions of sleep deprivation are found, but mainly the sleep deprivation is defined as sleep of less than 7 hours.[3] It was shown that short duration or poor quality of sleep lead toabnormal metabolism of glucose and abnormal secretion of anabolic hormones such as growth hormone[6], testosterone[7] and the prolactin[8], with changing of amount and time of secretion for other hormones such as glucocorticoids[9], catecholamines[10] with altering of diet balance[11,12].

Sleep deprivation and obesity are great health problems that are associated with many individual, social and health economic burden[13, 14,15]. Epidemiological studies held in USA revealed a direct linear association between duration of sleep and body mass index showing that abnormal sleep (long or short duration) was accompanied by adulthood obesity[16, 17]. Other literatures found abnormal sleep patterns significantly associated with increased BMI[18, 19,20]. Inversely, many authors documented no relationship observed between sleep duration and overweight or obesity[15, 21, 22].

Endogenous circadian system is regulating sleeping-awakening rhythms and other metabolism processes[23]. It was shown that timing of sleep early or late had

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a profound effect on cardiometabolic disorders[24-27]. Abnormal sleep patterns and inadequate sleep duration is commonly related to abnormal dietary habits and lifestyle changes like physical inactivity,heavy diet and sedentary lifestyle[28, 29].

In Iraq, the sleep problems are frequent among adults especially elderly age population[30-32].

Patients and Method

A cross sectional survey carried out in two Nutrition Clinics; Baghdad Teaching Hospital and Surgical Specialties Hospital in Baghdad. during six months; 1st of August, 2019 to 31st of January, 2020. Including 250 overweight or obese adults aged ≥18 years of both genders presented to Nutrition Clinics for management of overweight or obesity. Patients currently receiving sleep medications or sedatives, with mental health problems, depressive mood, pregnancy, lactation, night shifts occupation were excluded.

The data were collected by the researcher using a pre designed questionnaire prepared by the researcher depending on previous literatures. Data included general characteristics (age, gender, weight, height, occupation, marital status, smoking and medical history) and sleep patterns. Overweight or obesity defined according to World Health Organization standard values; obesity (BMI: 30 Kg/m^2 and more) and overweight (BMI: 25-29.9 Kg/m^2) [33].

The sleep patterns were assessed as the average for the last 7 days. Short sleep duration defined as sleep for<7 hours/day. Latesleep onset defined as sleeping at 11 o'clock pm or later[35].

The data were analyzed using the Statistical Package of Social Sciences software version 22. Appropriate statistical tests were applied accordingly at level of significance of 0.05 or less.

Results

This study included 250 overweight/obese adults with mean age of (40.8 years) .General characteristics of the study participants are shown in (Table 1).

Mean BMI of adults with short sleep duration was significantly higher than that of adults with normal sleep duration (P. value <0.001). No significant difference in mean BMI across sleep onset (P. value>0.05), (Table 2).

A significant association was found between short sleep duration and each of younger age, male gender, negative medical history and late sleep onset, in all comparison (P. value < 0.05). No significant association was found between sleep duration and other general characteristics variables, (P. value > 0.05), (Table 3).

Regarding the association between sleep onset and general characteristics variables of the study participants, a significant association was found between late sleep onset and each of younger age, being a student and smoking, in all comparison (P. value< 0.05). The association of sleep onset was neither significant with gender, marital status, nor medical history, (P. value > 0.05). (Table 4).

Table 1. General characteristics of overweight/obese adults (N = 250).

Variable		No.	%
Age (year)	<30 years	48	19.2
	30-39 years	80	32.0
	40-49 years	51	20.4
	50-59 years	34	13.6
	≥60 years	37	14.8
	Mean ±SD	40.8±13.4 year	-
Gender	Male	154	61.6
	Female	96	38.4
BMI (Kg/m^2)	Overweight	62	24.8
	Obese	188	75.2
	Mean ±SD	32.3±2.5	-
Occupation	Housewife	42	16.8
	Student	23	9.2
	Public servant	58	23.2
	Self employed	100	40.0
	Retired	27	10.8
Marital status	Married	182	72.8
	Not married	68	27.2
Smoking	Yes	83	33.2
	No	167	66.8
Medical history	Positive	107	42.8
	Negative	143	57.2
Sleep duration	Normal	141	56.4
	Short	109	43.6
	Mean±SD	7.23±1.6 hours	-
Sleep onset	Early	83	33.2
	Late	167	66.8

Table 2. Distribution of BMI of adults according to sleep duration and onset.

Variable		BMI (Kg/m^2) Mean±SD*	P. value
Sleep duration	Normal	31.6 ± 2.7	<0.001^S
	Short	33.2 ± 1.9	
Sleep onset	Early	32.34±2.6	0.900^{NS}
	Late	32.38±2.3	

SD: standard deviation S=Significant.

Table 3. Distribution of overweight/obese adults' general characteristics according to sleep duration.

Variable		Sleep Duration				P. value
		Normal		Short		
		No.	%	No.	%	
Age (year)	<30	18	12.8	30	27.5	0.008 ^{S}
	30-39	50	35.5	30	27.5	
	40-49	25	17.7	26	23.9	
	50-59	21	14.9	13	11.9	
	≥60	27	19.1	10	9.2	
Gender	Male	68	48.2	86	78.9	<0.001 ^{S}
	Female	73	51.8	23	21.1	
Occupation	Housewife	29	20.6	13	11.9	0.060 ^{NS}
	Student	11	7.8	12	11	
	Public servant	31	22	27	24.8	
	Self employed	50	35.5	50	45.9	
	Retired	20	14.2	7	6.4	
Marital status	Married	98	69.5	84	77.1	0.100 ^{NS}
	Not married	43	30.5	25	22.9	
Smoking	Yes	50	35.5	33	30.3	0.300 ^{NS}
	No	91	64.5	76	69.7	
Medical history	Positive	77	54.6	30	27.5	0.040^S
	Negative	64	45.4	79	72.5	
Sleep onset	Early	64	45.4	19	17.4	< 0.001^S
	Late	77	54.6	90	82.6	

S: Significant, NS; Not significant

Table 4. Distribution of overweight/obese adults' general characteristics according to sleep onset.

Variable		Sleep onset				P. value
		Early		Late		
		No.	%	No.	%	
Age (year)	<30	10	12	38	22.8	0.004 ^{S}
	30-39	33	39.8	47	28.1	
	40-49	22	26.5	29	17.4	
	50-59	4	4.8	30	18	
	≥60	14	16.9	23	13.8	

Variable		Sleep onset				P. value
		Early		Late		
		No.	%	No.	%	
Gender	Male	48	57.8	106	63.5	0.380 NS
	Female	35	42.2	61	36.5	
Occupation	Housewife	8	9.6	34	20.4	<0.001S
	Student	0	0.00	23	13.8	
	Public servant	11	13.3	47	28.1	
	Self employed	51	61.4	49	29.3	
	Retired	13	15.7	14	8.4	
Marital status	Married	61	73.5	121	72.5	0.800 NS
	Not married	22	26.5	46	27.5	
Smoking	Yes	17	20.5	66	39.5	0.003 S
	No	66	79.5	101	60.5	
Medical history	Positive	37	44.6	70	41.9	0.680 NS
	Negative	46	55.4	97	58.1	

S: Significant, NS; Not significant

Discussion

Sleep is a vital process of our life [36]. Overweight and obesity steadily increased in Iraq during last year's[3, 37]. The present study found that 43.6% of overweight/ obese adults had short sleep duration. This findings close to results of Althakafi et al [38] in Saudi Arabia. Our study showed 66.8% had late sleep onset among which is higher than results of Baron et al [39] study in USA. Higher prevalence of late sleeping in current study might be attributed to advanced mobile phone technologies and publicity of social network programs in our society during last ten years. BMI of the study participants in our study was significantly higher with short sleep duration. This finding is consistent with results of previous literatures [40,41]. Our study found no significant relationship between sleep onset and BMI. This is might be due to that all included adults were overweight or obese and higher proportion of them had late sleep onset.

Current study showed a significant association between younger age overweight/obese adults and short sleep duration (p=0.008). Similarly, Grandner et al[42] study in USA revealed that relationship between sleep duration and body mass index is dependable on age and reported a significant relationship between short sleep duration and higher BMI among young adults, U- shaped relation between sleep duration and BMI among middle age adults and less relationship among elderly. These findings are due sociocultural changes in community and widespread technologies that affect young age population leading to shorter sleep duration. Our study found also a highly significant association between males overweight/obese adults and short sleep duration (p<0.001). This finding is consistent with results of Watanabe et al [43] study in Japan which stated that increased weight is associated with short sleep duration among men but not among women. In present study, there was a significant association between positive medical history of overweight/obese adults and normal sleep duration (p=0.04). This finding might be attributed to fact that elderly age adults accompanying with positive medical history in present study are associated with normal sleep duration than younger age.

In current study, there was a significant association between younger age overweight/obese adults and late sleep onset (p=0.004). This finding coincides with results of Ferranti et al [44] which reported a significantly increased body mass index of young age adults with late sleep onset. Our study found a highly significant association was observed between students overweight/ obese adults and late sleep onset (p<0.001). This finding is similar to results of Gradisar et al [45] study in Australia which reported higher prevalence of delayed sleep onset among younger age students that are related to

obesity and sedentary lifestyle. The habitual changes for young adults is related to advanced technology recently attributed to poor sleep quality[45]. In present study, there was a significant association between smoking of overweight/obese adults and late sleep onset (p=0.003). This finding is in agreement with results of Tan et al [46] study in Sweden.

Present study found a highly significant association between late sleep onset of overweight/obese adults and short sleep duration (p<0.001). Consistently, Cooper et al [47] study in USA found that sleep duration less than 7 hours is related to obesity of adults and this short sleep duration is strongly linked to late sleep onset. Poor outcomes of abnormal circadian rhythm are aggravated by short sleep duration leading to abnormal metabolic processes and reduction of insulin sensitivity causing overweight and obesity[35]. The main limitations in present study were the inability to assess the direction of relationship as the design is cross sectional, selection bias and absence of adults with normal BMI to compare the sleep patterns with them.

In conclusion, the prevalence of abnormal sleep patterns (short sleep duration or late sleep onset) among overweight/obese adults is high. There is a strong link between short sleep duration and increased body mass index of adults. The common risk factors for short sleep duration are younger age, male gender and negative medical history, while common risk factors for late sleep onset are younger age, students with smoking history. This study recommended more efforts from health authorities and community based institutes to encourage normal patterns and prevent the behaviors that are accompanied by shorter sleep duration or late sleep onset especially for young age population. Further multicenter national surveys on effect of abnormal sleep patterns on health of adults must be supported.

Ethical Clearance: Informed consent was obtained from all participants, Data were collected in accordance with declaration of Helsinki of the World Medical Association, 2013

Conflict of Interest: Declared none.

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