

Correlation Between Obesity and Dietary Habit of the Adult Client at Out-Patient Clinic in Qalat Saleh City/ Iraq

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ABSTRACT

Objective: To identify correlation between obese adults clients and dietary pattern at out-patient clinic, and comparative differences among obesity categories of adults concerning their dietary habits.

Methodology: A cross-sectional design is carried throughout the present study at outpatients clinics in Qalat Saleh city, Iraq, for the period of November 11th, 2020, to August 15th 2021. Non-Probability "purposive" sample of (180) obese adult clients is selected and divided into (50%) females and (50%) males for each obesity grade.

Results: The current study confirmed that all obese adult clients grade I have a high level of mean score related to dietary habit, while obese adult clients in grade II & grade III revealed the majority of obese were in moderate level of the dietary pattern. Statistically, findings show that there is high correlation between obese adults grade I, grade II, and grade III and their dietary habits.

Conclusion: The dietary habits effect on obesity is (42%) and the others residual (48%). It is attributed to other factors: such the genetic factors; food frequency intake; and hormonal disturbance.

Recommendations: The study recommended emphasizing the implementation of health education programs related to following healthy lifestyles in determining the times of eating foods rich in carbohydrates and fats, and commitment to vital physical activity or regular daily exercise and avoiding sedentary activities.

Keywords: Correlation, Obesity, Adult Clients, Dietary Habit, Out-patients Clinics

INTRODUCTION

An Obesity is "a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems" [1]. The American Medical Association, in 2013 has categorized obesity as disease [2]. The prevalence of overweight and obesity around the world is increasing at an alarming rate in both developing and advanced countries, affecting virtually all social and economic aspects, regardless of age, gender or ethnicity [3]. Environmental and behavioral changes brought about by economic development, modernization and urbanization have associated with high rates of global obesity, and the health consequences are becoming clear [4]. As a result of the interaction between genotype and environment, overweight/obesity is a complex, multifactorial chronic disease [5]. Therefore, the etiology of overweight/obesity must be understood. This condition is associated with an increased risk of coronary heart disease, high blood pressure, diabetes, gallbladder disease, osteoporosis, some types of cancer, and many other diseases [6]. A large number of studies have been used in factor analysis or major component analysis of dietary pattern composition [7,8]. Adequate food consumption plays an important role in maintaining human health and increasing longevity [9,10]. Adequate food selection is an important key factor in maintaining body function and health [11]. In Iraq, according to the Chronic Non-communicable Disease Risk Factor Survey in 2006, two thirds of the respondents (66.9%) were found to be overweight (BMI \geq 25), the rate of weight gain among females (69.6%) is higher

than males (63.6%). Nearly one third of the respondents were found to be obese, and obesity was relatively higher than overweight among females (38.2% versus 31.4%), while overweight was prevalent among males (37.4% versus 26.2%). Obesity is not necessarily an indicator of wealth. This is partly due to consumption of an unhealthy diet as well as a lack of exercise or a sedentary lifestyle [12]. The objectives of study were to identify correlation between obese adults clients and dietary pattern at out-patient clinic, and comparative differences among obesity categories of adults concerning their dietary habits.

METHODOLOGY OF THE STUDY

A cross-sectional design is executed to achieve the aims of study for determining correlation between obesity and dietary patterns at out-patients clinics during the period of November 11th 2020 to August 15th 2021. The present study is conducted at Qalat Saleh city in four out-patient clinics. Non-Probability "purposive" sample of (180) obese adults are selected. These adults are divided equally relative to their gender for each obesity category. Collected data via utilization of adopted instrument in Arabic version; the use of structured interview technique with each adult client as way of data collection. The questionnaire is composed of three main parts as follows:

Part I: Anthropometric Measurements, The Body Mass Index (BMI) is calculated by the formula (WHO, 2014):

$$BMI = \frac{\text{Weight at kilograms}}{\text{Height with Meters}^2}$$

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Body Mass Index for obesity is classified to three grades according to the WHO classification.

Table 1: Categories of adults' obesity according to the calculation of body mass index

Categories	BMI = (kg/m ²)
Obesity Grade I	30.00 - 34.99
Obesity Grade II	35.00 - 39.99
Obesity Grade III	≥ 40.00

Part II: Socio-demographic data.

Part III: Dietary Habits. This section is composed of (19) items and all items are scored at three level type of Likert Scale; Always (3); Sometimes (2); and Never (1). Content validity and reliability are determined through a pilot study. The results of the present study are analysed via use of the SPSS version 24. Through descriptive statistics (frequencies, percentages, Arithmetic mean, mean score, and the standard deviations), as well statistical of inferential (Pearson Correlation Coefficient; ANOVA; Chi-square test; and multiple regression).

STATISTICAL RESULTS

Table 1: Allocation the sociodemographic data for obese adult clients

Socio-demographic Characteristics	Grade I		Grade II		Grade III		
	F	%	F	%	F	%	
Age (year)	18 – 39	41	68.3	29	48.3	32	53.3
	40 – 65	19	31.7	31	51.7	28	46.7
Level Education	Illiterate	8	13.3	9	15.0	6	10.0
	Read and Write	8	13.3	14	23.3	14	23.3
	Primary graduate	11	18.3	14	23.3	15	25.0
	Intermediate graduate	9	15.0	8	13.3	6	10.0
	Secondary graduate	6	10.0	2	3.3	3	5.0
Employment	College or Institute graduate	18	30.0	13	21.7	16	26.7
	High Professional	1	1.7	2	3.3	3	5.0
	Lower Professional	29	48.3	22	36.7	27	45.0
Residency	Unskilled Workers	30	50.0	36	60.0	30	50.0
	Urban	52	86.7	53	88.3	51	85.0
Marital Status	Rural	8	13.3	7	11.7	9	15.0
	Single	7	11.7	6	10.0	10	16.7
Socioeconomic Status	Marriage	53	88.3	54	90.0	50	83.3
	Low : 59 - & less	9	15.0	8	13.3	7	11.7
	Moderate :60 - 80	32	53.3	35	58.3	28	46.7
Monthly Income	High :81 – 100	19	31.7	17	28.3	25	41.7
	< 700000	28	46.7	26	43.3	23	38.3
Monthly Income	700000 – 1000000	20	33.3	14	23.3	18	30.0

The findings of table 1 for the study sample were showed that more two- third of obese adults clients grade I; and grade III have more of half concerning the age group both were within (18-39 years) it presented 41(68.3%),and 32(53.3%) respectively, also obese adults grade II were have more of half 31(51.7%) but within (40-65 years). Regarding the level of education, the results show that more obese adults clients in grade II 14(23.3%), and grade III it presented 15(25%) were primary graduate, while obese adults clients in grade I were college or Institute

graduate 18(30%). In addition, employment status shows there half of obesity adults clients grade I 30(50%), and in grade III 30(50%), while in grade II shows there more half 36(60%), they were unskilled workers.

Addition, residency showed that majority of grade I, grade II, and grade III of obesity adults patients were live urban as their percentage reached 52(86.7%), 53(88.3%), and 51(85%) respectively. With regard to marital status, it appears that majority of participants in study sample were married: grade I 53(88.3%), grade II 54(90%), and grade III 50(83.3%). Socio-economic status for the study sample were more than of half of participants of obesity adults in moderate level 32(53.3%) in grade I, and 35(58.3%) for grade II, while grade III was 28(46.7%). Addition, monthly income is demonstrated one-third of participants in each grade of obesity have < 700000 that is not enough as their percentage reached 28(46.7%), 26(43.3%), & 23(38.3%) respectively.

Table 2: Comparison among the dietary habits for obese adult clients according to Body Mass Index

Dietary Habits	Grade I	Grade II	Grade III	ANOVA d.f=177	
	M.S	M.S	M.S	F	Sig.
1. Eating breakfast	3.00	2.93	2.97	1.539	0.217
2. Eating three main meals	2.97	2.87	2.98	3.568	0.030
3. Eating substantive meals	2.95	2.30	2.30	43.925	0.000
4. Eating nuts	2.30	1.35	1.67	50.115	0.000
5. Eating salad with every meal	2.57	1.88	1.60	26.406	0.000
6. Eating leafy greens	2.30	1.20	1.58	67.869	0.000
7. Practicing physical exercise	2.83	2.22	2.35	17.424	0.000
8. Eating canned food	2.75	2.10	2.05	30.272	0.000
9. Eating frozen meat	2.98	2.28	2.12	105.196	0.000
10. Eating pickles	2.73	1.78	2.10	34.843	0.000
11. Using too much ghee in food	2.93	2.30	2.20	33.636	0.000
12. Eating sweets	2.50	1.88	2.18	13.616	0.000
13. Adding more salt while . eating food	2.92	2.68	2.58	8.145	0.000
14. Eating food during watching TV or talking on the phone	3.00	2.92	3.00	3.734	0.026
15. Eating red meat more than white meat	2.67	1.77	1.93	39.397	0.000
16. Drinking tea with sugar and other beverages	2.98	2.98	2.98	0.000	1.000
17. Drinking carbonated beverages	2.45	1.57	1.58	37.567	0.000
18. Drinking tea directly after meals	2.92	2.00	1.87	70.081	0.000
19. Eating fast food	2.32	1.15	1.05	206.674	0.000

This table 2 shows a statistically high significant difference among obese adults clients grade I; grade II; and grade III with their dietary habits relative to all items, except the two items (1. Eating breakfast & 16. Drinking tea with sugar and other beverages) which were demonstrated there is non-significant difference between obesity of adult clients and their dietary habits.

Table 3: Correlation between obesity and dietary habit of the adult client

Dietary Habits	N	Pearson Correlation	Sig.
1. Eating breakfast	180	-0.065-	0.383
2. Eating three main meals	180	0.026	0.729
3. Eating substantive meals	180	-0.499-**	0.000
4. Eating nuts	180	-0.394-**	0.000
5. Eating salad with every meal	180	-0.466-**	0.000
6. Eating leafy greens	180	-0.423-**	0.000
7. Practicing physical exercise	180	-0.302-**	0.000
8. Eating canned food	180	-0.452-**	0.000
9. Eating frozen meat	180	-0.694-**	0.000
10. Eating pickles	180	-0.348-**	0.000
11. Using too much ghee in food	180	-0.484-**	0.000
12. Eating sweets	180	-0.187-*	0.012
13. Adding more salt while eating food	180	-0.283-**	0.000
14. Eating food during watching TV or talking on the phone	180	0.000	1.000
15. Eating red meat more than white meat	180	-0.425-**	0.000
16. Drinking tea with sugar and other beverages	180	0.000	1.000
17. Drinking carbonated beverages	180	-0.468-**	0.000
18. Drinking tea directly after meals	180	-0.611-**	0.000
19. Eating fast food	180	-0.753-**	0.000

Table 3 demonstrates that there was a high correlation between obesity and dietary habit of the adult client at out-patient clinic in all items at ($P < 0.01$), except items (1. Eating breakfast, 2. Eating three main meals, 14. Eating food during watching TV or talking on the phone, and 16. Drinking tea with sugar and other beverages) showed that there is a non-significant differences association when ($P > 0.05$), while analyzed by Pearson Correlation.

Table 4: Evaluation dietary habits levels between obesity grade I, grade II, and grade III

Obesity	M.S. ± Std. Dev.	Dietary Habit Levels			Total
		Low	Moderate	High	
Grade I	(2.74 ± 0.119)	-	-	60 (100%)	60
Grade II	(2.11 ± 0.235)	2 (3.3%)	47 (78.4%)	11 (18.3%)	60
Grade III	(2.16 ± 0.183)	-	51 (85%)	9 (15%)	60
Total	(2.34 ± 0.339)	2 (1.1%)	98 (54.5%)	80 (44.4%)	180
Pearson Chi-Square	$X^{2obs.} = 115.820^a$ $X^{2crit.} = 9.49$ $df = 4$ $P \leq 0.01$ $P = 0.000$				

No. = number of variable , F=frequencies , % = Percentages, M.S.= mean of score, Std. Dev.= standard deviation, Eva.= Evaluation; Evaluation levels : (1.00-1.67) = Low; (1.68-2.33) = Moderate; (2.34-3.00) = Good

Table 5: Association by multiple regression between dependent variable (adult clients obesity) and independent variable (dietary habits)

Dependent Variable	Independent Variable		Model	ANOVA		
	Coefficients Value	Dietary Habits X		df	F	Sig.
B Unstandardized	54.685	7.592	R	0.650		
t-test	34.744	11.400	R ²	0.422	178	129.968
Sig.	0.000	0.000	R-2	0.419		0.000

R: Sample regression, df: degree of the freedom, sig: Significant, F: F- Test , Y: Obesity adults
 X_1 : Dietary habits, R²: Regression Square, R²: Adjusted Regression Square
 $Y(\text{obesity}) = \text{Error (Residual)} + \text{Dietary Habits (X)}$
 Regression equation $Y = 54.685 + 7.592 X$

Results of the table 4 reveals that all obese adult clients grade I have a high level of mean score 60(100%) related to dietary habit , with mean of score and standard deviation (2.74 ± 0.119) , while obese adult clients in grade II & grade III. It Showed the majority of obese were in a moderate level of dietary habit 47(78.4%), and 51 (85%) respectively. with mean of score and standard deviation (2.11 ± 0.235) for grade II, and (2.16 ± 0.183) of grade III. While the study sample as totally displayed that level evaluation of dietary habit were moderate and high levels 98 (54.5%), 80 (44.4%) respectively, with mean of score and standard deviation is reached (2.34 ± 0.339). Statistically, it has been proven that there are highly significant difference between obese adults grade I, grade II, and grade III and their dietary habits.

Statistically, table-5 shows a high significant difference between the obesity and dietary habits, when analyzed by multiple regression. The coefficients of regression was (0.650) ,while R Square equal (0.422), and Adjusted R Square, its percentage reached (0.419) . These results are explaining the dietary habits effect on obesity is (42%) and remaining (48%) is leading to other factors, such as genetic factors, food frequency intake and hormonal disturbance.

DISCUSSION

Part I: Discussion of the Obese Adults Clients Socio- Demographic Characteristics: The analysis of such socio-demographic characteristics depicts that the age groups are (68.3%) of study sample within (18 to 39) years old, (Table 1). The researcher confirms that the study sample was unskilled workers that lead to decrease level of physical activity and eating unhealthy diet leading to obesity, (25 %) of the study sample are primary school graduate, (Table 1) [13]. the study reveals that the obesity prevalence is lower when the level of education of the head of household increases (21.6%). (50 %) of the study sample are unskilled workers, (Table 1) [14] found (82%) of study sample was unskilled workers [15] depicts that (55.4%) of study sample was unskilled workers. Most of the sample is living at urban residential areas (86.7%), (Table 1) [16]. find that the majority of the obesity patients are living in urban areas (74.41%) and [15] depicts that the majority of the study sample are living at urban residential areas (96.7%), and (90%) of the study sample are married, (Table 1). This finding is in consistent with that of a studies by ⁽¹⁴⁾ found that (85%) of study sample was married and [17] which indicates that the majority of obesity patients are married (80.4%) and [12] in Missan Governorate the study reveal that the majority of study sample are married (85.9%). And (58.3%) of the study sample are with moderate socio-economic status, (Table 1). the study found that half of the obese adult's patients has moderate Socioeconomic Status (50.0%). While their monthly income the majority of the present study sample is (< 700000) (43.8%). (Table 1). and found that the majority of the present study sample is (< 700000) (43.8%).

Part II: Discussion of Correlation Between Obesity of the Adults Clients and their Dietary Habit: Regarding to the analysis of dietary habits among the obese adult clients for class I, II and class III, the results show that there is a highly significant association between grades of obesity and the dietary habits. It is obvious that obese adults, who practice healthy dietary habits, may experience low incidence of greater obesity rates or grades, and those who practice risky dietary habits become more vulnerable to develop advanced grades of obesity (Table 2,3,4). Unhealthy dietary habits, and lack of physical activity are the main causes of obesity. Foods with high diet in saturated fats and sugars and low in fruits and vegetables is one of the leading risk factors for obesity ⁽¹⁸⁾. This result is in an agreement with that of ⁽¹⁹⁾ who found that most of the high prevalence rate of obesity may be due to consumption of unhealthy food, sedentary lifestyle and lack of physical exercise.

Another study by [20] found that most of the obesity risks or weight gain is directly related to bad eating habits: such as skipping meals; eating away from home; and high consumption of fast food and processed, eating most of calories which contribute to weight gain: calories at night; drinking high-calorie beverages, as well as low consumption of fruit and vegetables.

The data analysis of the obesity of adult patients regarding the dietary habits and food frequent intake the effect the independent variable (dietary habits) on the dependent variable (obesity) is the dietary habits effect on obesity is (42%) and the remaining (48%) is due to other factors, such as heredity, food frequency intake and hormonal disturbance ,age, marital status and level of education(Table 5). A study by [21] found that most of the obesity is caused by Leptin a protein hormone which is considered a key component in regulating (energy intake) and (expenditure) [22] indicate that the majority of obesity clients is Gonadal hormones also influence food intake and energy expenditure [15] depicts that the the effect the (dietary habits) on the (obesity class) is (12%) and the (88%) and is effect by other factors such as (age, marital status and heredity).

CONCLUSION

1. Current study revealed that all obese adult clients grade I have a high level of mean score related to dietary habit, while obese adult clients in grade II & grade III, showed the majority of obese were in moderate level of dietary pattern.
2. Statistically, present study is show that there was high significant difference between obese adults grade I, grade II, and grade III, and their dietary habits
3. The dietary habits effect on obesity is (42%) and the residual (48%) is due to others factors: such (genetic factors, food frequency intake and hormonal disturbance).

RECOMMENDATION

1. The study recommended emphasizing the implementation of health education programs related to following healthy lifestyles in determining the times of eating foods rich in carbohydrates and fats.
2. Commitment to vital physical activity or regular daily exercise and avoiding sedentary activities.
3. Implementation of an early detection program for obesity in every hospital and in every primary health care center in Misan Governorate.

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and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

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REFERENCES

1. Madani KA. Obesity in Saudi Arabia. Bahrain Med Bull 2000;22(3):113-8.
2. Weinstock M. The facts about obesity. H&HN. Am Hosp Assoc 2013; 8(6):428-30.
3. Kosti RI, Panagiotakos DB. The epidemic of obesity in children and adolescents in the world. Cent Eur J Public Health 2006;14(4):151-9]
4. Da Mota GR, Zanesco A. Leptin, ghrelin, and physical exercise. Arq Bras Endocrinol Metabol 2007;51(1):25-33]
5. Musaiger AO, Al-Mannai MA. Factors related to weight status of the adult Bahraini population (a communitybased study). Bahrain Med Bull 2000;22(3):119-22.
6. Hamer M, Brunner EJ, Bell J, et al. Physical activity patterns over 10 waist circumference: the Whitehall II and body mass index years in relation to cohort study. Obesity Silver Spring 2013;21(1):E755-61.
7. Al Abedi G, Naji A. Impact of Physical Activity Program upon Elderly Quality of Life at Al-Amara City/Iraq. Medico Legal Update 2020;20(3):1223-8.
8. Cho YA, Shin A, Kim J. Dietary patterns are associated with body mass index in a korean population. J Am Diet Assoc 2011;111(1):1182-6.
9. Perry D. Researching the aging well process. Am Beh Scient 1995;39(2):152-71]
10. Tucker HN, Miguel SG. Cost containment through nutrition intervention. Nutr Rev 1996;54(4):111-121]
11. Matteson MA. Functional assessment of the elderly. In Nurse Practitioner Forum 1997; 8(3):91-8]
12. Ministry of Health MH. Directorate of Public Health and Primary Health Care-Iraq, Ministry of Planning and Development Cooperation, Central Organization for Statistics and Information -Iraq, World Health Organization: Chronic Non-communicable Diseases Risk Factor Survey in Iraq, 2006.
13. Gutierrez-Fisac JL, Regidor E, Banegas JB, et al. The size of obesity differences associated with educational level in Spain, 1987 and 1995/97. J Epidemiol Community Health 2002;56(6):457-60]
14. Al Tawil NG, Abdulla MM, Abdul Ameer AJ. Prevalence of and factors associated with overweight and obesity among a group of Iraqi women. East Mediterr Health J 2007;13(2):420-9]
15. Hamead MA, Abdul Wahid, H. S. Obesity of Adult Patients at Out-patient Clinics in Missan Governorate. A Thesis Submitted to the Department of Community Nursing, College of Nursing University of Baghdad 2014;46.
16. Shirazi IB, Hamid S, Rafi M, et al. A cross-sectional study to determine sex-wise prevalence of obesity in adults of Kashmiri population, 2014]
17. Tzotzas T, Vlahavas G, Papadopoulou SK, et al. Marital status and educational level associated to obesity in Greek adults: data from the National Epidemiological Survey. BMC Public Health 2010;10(1):1-8]
18. Norum KR. World Health Organization's Global Strategy on diet, physical activity and health: the process behind the scenes. Scand J Nutr 2005;49(2):83-8]

19. Hmoud M, Abdul M. Obesity and Work Stress Among the Doctors in Missan governorate : A Dissertation Submitted to the Scientific Council of family and community medicine in partial Fulfillment for degree of Fellowship of the Iraqi Board for Medical Specialization in Community Medicine,2012;15-23.
20. Reddy KS, Katan MB. Diet, nutrition and the prevention of hypertension and cardiovascular diseases. *Public Health Nutr* 2004;7(1a):167-86.
21. Labib M. The investigation and management of obesity. *J Clin Pathol* 2003;56(1):17-25.
22. Clegg DJ, Woods SC. The physiology of obesity. *Clin Obstet Gynecol* 2004;47(4): 967-79.