

# Frequency of Bulimia Nervosa and Binge Eating Disorder in obese females and the Relationship with Some Individual Characteristics

Hadeel Fadhil Farhood

Assistant professor, department of Community Medicine ,college of medicine, Babylon University ,  
Babylon ,Iraq

\* E-mail of the corresponding author: hadeelfadhil@yahoo.com

## Abstract

eating disorder nowadays considered as a primary health issue since growing incidence and health consequences of eating disorders among the population. Bulimia nervosa is a disorder which disrupts the ability to maintain a 'normal' eating pattern.

Aim of study : to determine the prevalence of bulimia nervosa and binge eating disorder among obese persons and the difference of some Individual Characteristics factors in obese females with eating disorders (binge eating disorder and bulimia nervosa) and obese females without eating disorders.

Patients and method : a cross sectional study from August -2012 to March- 2013 , for randomly selected (190) obese females , their body mass index (BMI)  $\geq 30$  Kg/m<sup>2</sup> , age range from 15 to 60 years, (40 ,21%) met the definition and criteria of Binge eating disorder (BED) and Bulimia nervosa (BN). (32, 16.84%) were BE and (8, 4.23%) were BN. Others (150, 78.9%) were obese female without any eating disorder . constricted Questionnaires regarding the diagnostic criteria of Binge eating disorder and bulimia nervosa and socio demographic factors for both groups are taken and other variable related to the health factors: classes of obesity , history chronic stress, sleep disturbances, and , history of hypertension or treatments to it , history of diabetes mellitus and factors related to female such as MD (menstrual disturbance), and other food related factors : favorite food, meal frequency and snack frequency. anthropometric measurements (weight, height then body mass index (BMI)) were taken .

Results: The total number of patient collected to these study (190) patients. 40 (21%) met the definition and criteria of eating disorder and bulimia nervosa , other 150(78.9%) consider as obese without eating disorder group .45% of study group with eating disorders in age group 26-35 compared with 37.9% in obese group without eating disorder. There was a statistical significant relationship regarding age group, residence, marital state and educational level between the study groups with( p-value = 0.002 , 0.002, 0.021,0.036 ) respectively, with no difference regarding occupation(p-value=0.420). and 47.5% of eating disorder group were in class II obesity compared with 37.3% in obese group without eating disorder with statistical significant ( $\chi^2=7.720, df=2$  ,p-value=0.021). and 52.5% of eating disorder group reported body shape stressor compared with 23.3% in the other study group with significant difference between the study groups regarding report of stress and history of diabetes mellitus ( $\chi^2=13.256, df=3$  ,p-value=0.004) , ( $\chi^2=12.66, df=1$  ,p-value=0.000) respectively and no difference regarding sleep disturbance , menstrual disturbance and hypertension (p-value =0.375 , 0.215, 0.196) respectively .65% of obese with eating disorder group prefer mixed and fatty meal compare with 34.7% in obese without eating disorder (p-value=0.001) and significant difference regarding meal and snack intake between the study groups (p-value= 0.011,0.024) respectively.

conclusion, obese women with binge eating disorder and bulimia nervosa appear to report younger age ,live in cities mostly married and had college and post graduate level of education that is different compared to obese women without binge eating and bulimic disorder those who reported lighter body weight and body shape stressor and the majority of eating disorders group report no history of diabetes mellitus , they also prefer mixed and fatty meal and the majority of them reported consume lunch meal and afternoon snack regularly.

**Keywords:** obesity, binge eating

## 1. Introduction

Eating disorders comprise a range of syndromes encompassing physical, psychological and social features. Whilst the acute physical complications of these disorders may provoke great concern in family members and health service staff, anorexia nervosa and bulimia nervosa are frequently chronic conditions with substantial long-term physical and social sequelae, from which recovery is difficult (Agras et al 2000).

Since 1980, bulimia nervosa has been recognized by the American Psychiatric Association as an autonomous eating disorder (Fairburn et al 2000). According to the National Eating Disorders Association (NEDA, 2008), approximately 9 million women in the US struggle with an eating disorder (ED). To put this in perspective, in

2005, approximately 4.5 million people had Alzheimer's disease and about 2.2 million had Schizophrenia. Bulimia nervosa (BN) accounts for the highest number of eating disorder incidents and disproportionately affects women (Adams, P. et al 2003, Keel et al 2005).

The term bulimia means "an extreme hunger," but the word is most commonly understood to refer to "BULIMIA NERVOSA" which is characterized by recurrent episodes of binge eating followed by such regular activities as self-induced vomiting, excessive use of laxatives and/or diuretics, fasting or dieting, and vigorous exercise—all of which are directed at weight control. A characteristic feature in the bulimic patient is a persistent concern with weight, body shape and body image and is associated with depression and other psychiatric disorders (Fairburn, Christopher G., et al. 2000, Barabasz M 2007).

Binge eating is eating, in a discrete period of time (eg, 2 h) an amount of food that is significantly larger than is typical for most people during the same defined period. This behavior is associated with a perceived loss of control of eating during this time which should be distinguished from. However, unlike individuals with BN, they do not engage in inappropriate weight control behaviors, and it is frequently associated with obesity which should be distinguished from overeating episode that is defined as The consumption of an unusually large amount of food in a defined period, without concomitant perception of loss of control and Subjective bulimic episode is The consumption of objectively minimal amounts of food in a defined period with a perception of loss of control (Santonastaso P, et al 2006 & American Psychiatric Association DSM-5 Development 2010).

Binge eating disorder (BED) is the most common eating disorder in the United States affecting 3.5% of females and 2% of males and is prevalent in up to 30% of those seeking weight loss treatments. Although it is not yet classified as a separate eating disorder, it was first described in 1959 by psychiatrist and researcher Albert Stunkard as "Night Eating Syndrome" (NES), and the term "Binge Eating Disorder" was coined to describe the same bingeing-type eating behavior without the exclusive nocturnal component. BED usually leads to obesity although it can occur in normal weight individuals (Hudson, JI; Hiripi, E; et al 2007). Obesity is associated with but is not necessary for the diagnosis of BED, and that it is not uncommon to see BED in cases without obesity (Grilo CM. 2002).

The causes of eating disorder is not clear, but it probably results from a combination of family history, social values (such as admiring thinness), and certain personality traits (such as perfectionism) There is no single, identifiable cause of anorexia nervosa or bulimia nervosa, and more research is required to understand the complex interactions between the various forces (personality, biology, genetics, environment) at play in determining who develops an eating disorder and who does not (Gwirtsman HE, et al. 2008 & Hay PJ. 2010), but one thing is certain that bulimia is a complex emotional issue. Eating can be an emotional release so it's not surprising that people binge and purge when feeling angry, depressed, stressed, or anxious [Arnold 2003, NICE 2004 & Cavanaugh, C. and L. Ray 1999]. Overall, people with BED differ from those who do not binge eat, and BED appears to have important similarities with and differences from BN [9]. BED and BN differ in their risk factor profiles (Fairburn CG, et al 1998) and in their natural course and outcome (Fairburn CG, et al 2000 & Zimmerman M. 1994), and they resemble different (latent) categories of eating problems (Bulik CM, et al 2000). The global epidemic of overweight and obesity "globesity" is rapidly becoming a major public health problem in many parts of the world, and they are the serious risk factors for a number of chronic diseases, including diabetes mellitus, cardiovascular disease, and cancer. Overweight and obesity are the fifth leading risk for global deaths (WHO 2012).

According to WHO, Overweight and obesity are defined as abnormal or excessive fat accumulation that may be risk to the health. A crude population measure of obesity is the body mass index (BMI) which is equal to body weight in kilograms divided by the height in meters squared ( $BMI = \text{Weight kg} / \text{Height m}^2$ ),  $BMI \geq 30$  consider obese (International Union of Nutritional Sciences (IUNS) 2010). Although the emerging literatures suggest the validity of BED, many substantive questions remain about its diagnostic features and its specific and associated psychopathology (Grilo CM 1998). Studies using clinical (Masheb RM, Grilo CM 2000) and community samples (Striegel-Moore RH, Cachelin FM, et al 2001) have found that although people with BN generally report higher levels of dietary restraint, people with BN and BED tend to report similar eating disorder-specific attitudes and overvalued ideas regarding weight and shape.

This study specifically deals with eating disorders (bulimia nervosa (BN) and binge eating disorder (BED)) although they are independently classified, both disorders are closely related and with obese females without eating disorders.

BED differs from BN because it does not present the use of compensatory behaviors. Diagnostic Criteria for Bulimia Nervosa and binge eating disorder include:

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:

1-Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger

than most people would eat during a similar period of time and under similar circumstances.

2-A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).)

B-Recurrent inappropriate compensatory behavior in order to prevent weight gain, such as self-induced vomiting; misuse of laxatives, diuretics, enemas, or other medications; fasting, or excessive exercise

C- The binge eating and inappropriate compensatory behaviors both occur, on average, at least twice a week for 3 months

D- Self-evaluation is unduly influenced by body shape and weight

E. The disturbance does not occur exclusively during episodes of Anorexia Nervosa

Specify type: Purging Type: during the current episode of Bulimia Nervosa, the person has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Non-purging Type: during the current episode of Bulimia Nervosa, the person has used other inappropriate compensatory behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas (American Psychiatric Association (2000).

The goal of this study was to(1) determine the prevalence of bulimia nervosa and binge eating disorder among obese persons and(2) the difference of some Individual Characteristics factors in obese females with eating disorders(binge eating disorder and bulimia nervosa) and obese females without eating disorders.

## 2. Subjects and methods:

*Design and setting* : this cross- sectional , conducted in Hilla city in Babylon governorate in Iraq from August - 2012 to March- 2013 for obese female attended nutrition clinic , data collection Consent form includes a simple description of the study to all the persons included in the study. Each obese person was individually interviewed to evaluate if she met the study's criteria of BE and BN (American Psychiatric Association (2000) and other variables related to socio demographic factors for both groups : age group ,residence , occupation , Marital state , educational level . other variable related to the health related factors: classes of obesity , history chronic stress, sleep disturbances, and , history of hypertension or treatments , history of diabetes mellitus to it and factors related to female such as MD (menstrual disturbance), and other food related factors : favorite food, history of regular meal and snack intake.

*Subjects* : a study was conducted on convenience sampling technique from randomly selected (190) obese females , their body mass index (BMI)  $\geq 30$  Kg/m<sup>2</sup> , age range from 15 to 60 years .Their concept to participate in this study were taken from all the subjects. All participants included in this study were free from metabolic disorders, were not under treatment for coronary heart disease, dyslipidemia or endocrine disorders, were not involved in a weight-loss intervention and had a stable weight for at least 3 months.

*Data collection tools*: a specially designed data sheet was used; to assess the frequency of( BE) and (BN) in obese patients from Nutrition clinic in Iraq, Babylon governorate - Hilla city and this sheet contain:

1-Questionnaires: include:

A- diagnostic criteria of (BE) and (BN) and specify the types of BN: purging type and non- purging type (American Psychiatric Association (2000).

B-socio demographic factors :- name, age(divided into three age groups 15-25,26-35,36-45,and 45-60 years old), residence (rural and urban) , occupation (employee, housewife),marital state( married, devided ,widow and not married) , educational level(illiterate , primary and secondary, college and postgraduate).

C- health-related risk factors: obesity classes (class I (30-34.99) , class 2 (35- 39.99) and class 3( $\geq 40.00$ ) , history chronic stress, sleep disturbances, history of hypertension or treatments to it, history of diabetes mellitus and factors related to female such as MD (menstrual disturbance).

D- food – related factors : type of favorites food( if sweet , chocolate, beverage, juice or fruit and vegetables and mixed fatty meal and fast food), regular meal and snack intake)

2- anthropometric measurements (weight, height, body mass index(BMI)).

*Data Analysis*:

Recording information was checked for missing values and data entry errors. Statistical analysis was performed using Statistical Package for Social Science software (SPSS, version 17) and Microsoft office Excel 2010 was used for data processing and statistical analysis. Variables were described using frequency distribution and percentage for the patients according to their characteristics and mean (-x); standard deviation (SD) for continuous variable .The chi-squared test was used for the assessment of association between the variables studied. The p- value of less than 0.05 was significant statistically.

## 3. Result:

The total number of patient collected to these study (190) patients. The minimum age 15 years old and maximum

60 years old (mean age  $\pm$  standard deviation) was (33.2 $\pm$ 10.41 SD). 40 (21%) met the definition and criteria of BED and BN, (32, 16.84%) had BED and (8, 4.23%) were BN [table 1]. The questionnaires also included what were the compensatory behaviors associated with BN and the results were:

(2, 25%) of BN patients reported history of self-induced vomiting or use laxative or diuretics drugs, (6, 75%) reported fasting and did excessive rigid exercise regimen (despite weather, fatigue, illness or injury to burn of calories taken in a meal).

The age groups distribution found that (72, 37.9%) of obese female seeking for obesity treatment were at age group (26-35 years). (45%) of patient with eating disorders were at age group (26-35 years) while (38%) of obese group without eating disorder were at age group (46-60) and there was statistical significant relationship regarding age groups between two study groups ( $\chi^2=14.872$ ,  $df=3$ ,  $p$  value=0.002). (77.5%) of eating disorder (ED) participants lived in urban area and (22.5%) of them lived in a rural area while (52.7%, 47.3%) of obese without eating disorder lived in rural and urban area respectively, there was statistical significant regarding residence and educational level between the study groups with ( $\chi^2=11.558$ ,  $df=1$ ,  $p$ -value=0.002) and ( $\chi^2=6.676$ ,  $df=2$ ,  $p$ -value=0.036) respectively, and with the marital of the females ( $\chi^2=9.698$ ,  $df=3$ ,  $p$ -value=0.021) when (50% of obese without eating disorder were unmarried and 45% of obese with eating disorder were married) [Table 2]. Table 3 shows the distribution of study groups according to some health related factors when (39.5%) of the study groups had class II obesity. (47.5%) of eating disorders patients had class II obesity with BMI (35-39.99 Kg/m<sup>2</sup>) and (40.7%) of obese without eating disorder had class III obesity with BMI ( $\geq 40$  Kg/m<sup>2</sup>) [figure 1], with statistical significant relationship regarding obesity classes between the study groups ( $\chi^2=7.720$ ,  $df=2$ ,  $p$ -value=0.021). (43.7%) of study groups had Sleep disturbance and (56.3%) obese females had no sleep disturbance with no statistical significant relationship between two studied groups ( $\chi^2=0.788$ ,  $df=1$ ,  $p$ -value=0.375) also no significant relationship regarding menstrual disturbance and blood pressure between the study groups with ( $\chi^2=1.537$ ,  $df=7$ ,  $p$ -value=0.215), ( $\chi^2=1.672$ ,  $df=1$ ,  $p$ -value=0.196) respectively [table 3], and (60%) of participants reported history of diabetes mellitus with strong significant difference between the study groups ( $\chi^2=12.66$ ,  $df=1$ ,  $p$ -value=0.000).

Table 3 shows that (52.5%) of obese with eating disorder had Body shape stressor, and (15%) reported work and money related stressor, (7.5%) reported relationship stressor and (25%) of them reported other stressor related to moves and change houses or tutors event or death in family compared with (23.3%) of obese group without eating disorders had Body shape stressor, (28%) reported work and money related stressor, (14.7%) reported relationship stressor and (34%) of them reported other stressor related to moves and change houses or tutors event or death in family with significant difference between the study groups ( $\chi^2=13.256$ ,  $df=3$ ,  $p$ -value=0.004).

Then asked all the participants in study about favorite food. In eating disorders group there were (25%, 65%) of participant prefers to consumed sweet, chocolate, beverage, juice others prefer mixed fatty meal and fast food respectively, compared with (58.7%, 34.7%) of obese without eating disorder group respectively with significant difference between two groups ( $\chi^2=14.926$ ,  $df=2$ ,  $p$  value=0.001). [table 4]

Regarding the regular meal intake table 4 present that (12.5%, 57.5%) of obese with eating disorder had breakfast and lunch regularly compared with (33.5%, 52%) of obese without eating disorders group respectively with significant difference between two groups ( $\chi^2=9.064$ ,  $df=2$ ,  $p$ -value=0.011) and (15%, 60%, 12.5%, 12.5%) of obese with eating disorder reported midmorning, afternoon, evening and nocturnal snack regularly compared with (26.7%, 35.3%, 27.3% and 10.7%) in obese without eating disorder group respectively with significant difference between the study groups ( $\chi^2=9.482$ ,  $df=3$ ,  $p$ -value=0.024). [table 4]

#### 4-Discussion:

Eating disorder nowadays considered as a primary health issue since growing incidence and health consequences of eating disorders and obesity among the population (Agras, W.S., et al 2000).<sup>5</sup> This study specifically deals with bulimia nervosa (BN) and binge eating disorder (BED) although they are independently classified, both disorders are closely related. BED differs from BN because it does not present the use of compensatory behaviors. Eating disorders are conditions defined by abnormal eating habits that may involve either insufficient or excessive food intake to the detriment of an individual's physical and mental health. (Hudson, JI; et al 2007). This study compared obese women with eating disorders (BN and BED) with obese without eating disorders, this study design of choosing obese women and compare between them and not between obese with binge eating disorder and bulimia nervosa with non-obese person because any difference between the last compare groups may be related to be obese or not, so prefer to choose all the participant are obese. I could not find similar national studies about the eating disorder among adult patients.

Other studies work comparing BN and BED by considering physical differences, age and obesity status and depression levels, and other studies contrasting obese and non-obese patients with BED to BN, others studies compare non-purging BN to BED (Hay P, Fairburn C 1998, Santonastaso P, et al. 1999 & Buddeberg-Fischer B, Bernet

R,etal 1996).There is little data on the prevalence of bulimia nervosa in general populations. Most studies conducted thus far have been on convenience samples from hospital patients, high school or university students (Makino M, Tsuboi K, Dennerstein L 2004, Hay PJ, Mond J, etal 2008). This study was conducted on (190) obese females who come to nutritional clinic for weight loss program, 40(21%) met the definition and criteria of BE and BN , (32, 16.84%) had BE and (8,4.23 %) were BN , the other studies showed the prevalence of binge eating disorder is approximately 2-3% of the general population, 8% of the obese population, and lower prevalence than other study that found BED prevalence were 30% among patients undergoing treatment to lose weight (Coutinho W, Póvoa LC.etal 1998) ,and agree with other study found a BED frequency of 16% in obese women in a weight watchers program (Borges MBF.etal 1998). This study reported ( 8, 4.23%) of participant were BN ,(25%) purging type and (75%) non- purging type BN, Other study reported the prevalence of bulimia nervosa was (2.3%, 76%) of the women suffered from its purging subtype and 24% from the non-purging subtype. The incidence rate of bulimia nervosa was 300/100000 person-years at the peak age of incidence, 16-20 years, and 150/100000 at 10-24 years [Keski-Rahkonen A, etal 2009,]. This study compared obese patients with eating disorders (BED and BN) with obese patients without eating disorders. The obese with eating disorder group was significantly younger with (45%)at age group (26-35) than the comparable group that (38%) at age group (46-60) this result similar to other study, that report the high prevalence of eating disorders were young women (Hay, P.J. & Bacaltchuk, J. 2003). [Table 2].

Table 2 also present a significant difference regarding residence of the study groups with (p-value= 0.002) (77.5% and 47.3%) of obese with eating disorders and without eating disorders groups lives in urban area respectively, this result agree with other study that report eating disorders occurs more frequently in developed countries and in cities, (Tölgyes T, Nemessury J 2004) and 52.5% of eating disorder group had college and postgraduate educational level compared with44% of obese group without eating disorders that had primary and secondary educational level these result agree with a number of empirical papers also document differences in education (Hudson, J., etal 2007 , Reagan, P. and J. Hersch 2005& Striegel-Moore RH, and Dohm FA. et al. 2003).

table 2 shows that (47.5%) of ED group were house wife & (52.5%) were employed with no significant difference between the study groups ( $\chi^2=0.651,df=1, p\text{-value}=0.420$ ) this result disagree with other explanation The negative impact of BED and BN are even more serious for the very young since they had irreversible effects on physical development and emotional growth. Moreover, binge and bulimics persist in their behaviors hence, as with any serious persistent disease, they likely to negatively affect human capital accumulation (Keel, P., etal 2005, Striegel-Moore RH, and Dohm FA. et al 2003).

Table 2 also shows significant relationship in marital state between two groups (p-value=0.021) , (22.5%) of ED group were unmarried (45%) married compare to (50%) of without eating disorders group were unmarried. that was differs from other study as most patients with eating disorders are single, college educated, and in their mid-20s that represent no difference regarding marital state (Striegel-Moore RH, etal 2003

&Reagan, P. and J. Hersch 2005) This study shows that the subjects without ED heavier than obese with eating disorders were (40.7%) was class III obesity compare with (17.5%) in obese with eating disorder and (47.5%) of ED group reported class II obesity (BMI=35-39.9Kg/m<sup>2</sup> , with statistically significant (p-value=0.021) [table3].that's BED usually leads to obesity although it can occur in normal weight individuals (Hudson, JI; Hiripi, E; etal 2007),and These findings agreed with other Studies using clinical and community samples(Wilfley DE, etal 2000) have found that although people with BN generally report higher levels of dietary restraint, people with BN and BED tend to report similar eating disorder-specific attitudes and overvalued ideas regarding weight and shape ,two different studies (Masheb RM 2000, Wilfley DE, etal 2000) found that the marked similarities in eating disorder-specific cognitions among BN and BED were unrelated to body mass index (BMI) and other study reported the obesity status that it is not uncommon to see BED in cases without obesity( Grilo CM 2002). Sleep disturbance also reported in ED group (37.5%) and (62.5%) without sleep disturbance compared to (45.3%) in the other group with no significant association between two groups ( $\chi^2=0.788, df=1, p\text{-value}=0.375$ )[ table 3]. This result may be due to both study groups were obese and sleep disturbance and sleep apnea are complication of obesity. the high prevalence of obese with eating disorder group reported no sleep disturbance that may be due to most of them are lighter than obese without eating disorders( BED & BN) , that disagree with a brief report from Psychiatry Research examined the prevalence and correlates of sleep problems in women with eating disorders suggested that sleep disturbances are important clinical markers of eating disorder that reported Prevalence of any sleep disturbance rate was estimated at (50.3%) of the population ,Sleep disturbance occurred at higher rates in subjects with more severe eating disorder pathology and Sleep disturbance tended to correlate with bingeing and purging behaviors(Kim, K.R., et al 2010). Table 3 reported a significant statistical association between the eating groups regarding exposure to chronic stressor ( $\chi^2=13.256,$

df=3,  $p$ -value=0.004). (52.5%) of EDs group reported body shape stressor compared with (23.3%) in obese female without eating disorder group. Negative body image and an unhealthy relationship with food can cause stress, but it also works the other way around. The relationship between stress and eating disorders is, in many ways, a vicious cycle: Feelings of being stressed or overwhelmed can trigger disordered eating behaviors, which are used as a coping mechanism. And in turn, the compulsive behavior, fears and constant negative thoughts that characterize eating disorders raises stress levels. this study also reported (15%, 28%) of EDs & without EDs groups reported Work& Money related stressor respectively and 10 out of 32 (25%) of obese with ED group reported exposure to other stressor events(moves, tutors event , death in family, premature separation of parent) , these Traumatic experiences are pointed in some studies and such experiences may have precipitated the occurrence of dysfunctional eating standards People with different cultural backgrounds may develop eating disorders because it's hard to adapt to a new culture (a theory called "culture clash"). The stress of trying to live in two different cultures or cities or change houses may cause some minorities to develop their eating disorders(Polivy J., 2002). Also table 2 represent no significant association between two study groups ( $\chi^2=0.215$ , df=7,  $p$ -value=0.215) regarding menstrual disturbance may be due to all the participant were obese. (55%) of EDs group reported menstrual disturbance compared with other group without eating disorder (44%), that is disagree with other results where there are some of the many signs that may indicate whether someone has binge eating disorder and bulimia nervosa were irregular menstrual cycle (Mercury 2010, Gendall KA 2000). Menstrual disturbances occurring in women with eating disorders may be secondary to a decrease in the pulsatility of gonadotropin-releasing hormone and possibly to the hormonal mechanisms of leptin, which decreases with decreasing weight, but other study that reported Since a threshold level of weight or body fat is believed to be necessary for normal reproductive functioning, normal or overweight bulimics are less likely to experience menstrual disturbance (Grinspoon S, Gulick T.1996).also table 2 shows no significant association between two groups regarding hypertension this may be duo to both groups were obese. But also table 2 reported a strong relationship regarding history of diabetes mellitus (DM) ( $\chi^2=12.66$ , df=1,  $p$ -value=0.000),(30,75%) of obese with eating disorder group had no DM compared with (53.3%) with diabetes history that may patient with DM were psychologically more aware about food and calories to pass in binge and bulimic eating attack. Table 4 shows (51.6%) of obese study groups prefer sweet and chocolate with significant relation in favorite food type between 2 groups ( $p$ -value=0.001) were the obese with EDs group prefer mixed meal(65%) and obese without EDs group prefer sweet and chocolate(58.7%) compare with (25%) in obese with EDs and only(10%) of them prefer fruit and vegetable. This finding may be due to people crave chocolate in times of stress and anxiety and they feel good with both the taste and the after effects. Chocolate is a natural painkiller which also mimics the effects of marijuana (ganja), boosting the pleasure received from eating it. Chocolate helps elevate brain Serotonin, a hormone which helps us to relax and is an antidepressant. Eating chocolate is a natural way to elevate the spirits and feel better about life!, but this study's' result may opposite to other explanation that person with binge eating disorder and bulimia nervosa could consume a large quantity of fruits and vegetables of the same caloric amount as a candy bar but not view it as a binge because fruits and vegetables are "good" or "safe" foods. However, bulimics tend to define binges by the type of food consumed and their mood state while consuming, not necessarily by the actual caloric intake (Coutinho W1998, Borges MBF.1998) For instance, snack foods and desserts are viewed as binge foods more often than are other foods. Some bulimics may have an internal list of for bidden foods that, when consumed, will constitute a binge to that patient, regardless of caloric content (Gleaves DH, Williamson DA1993). Bing eating and bulimic episodes are frequently planned, with food purchased or prepared in order to be consumed without interruption these may explain why obese with eating disorder group reported (65%) prefer mixed and fatty meal. The individual may also avoid situations in which they are likely to be exposed to food or will find it difficult to control their eating, such as when eating out with others. This avoidance behavior tends to add to any social and a relationship difficulty that may be present Mood disturbance is extremely common in bulimia nervosa and symptoms of anxiety and tension are frequently experienced. In more severe cases, patients with eating disorders may alter daily schedules to be assured of time for bingeing and purging. They may also deprive themselves of food for hours before the binge, and it is thought that this deprivation plays into the ritualistic pattern of bulimic eating (Hetherington MM, Altemus M, et al. 1994) because regular binges may be costly, food may be stolen from grocery and convenience stores (Mitchell JE, Gibeau L, et al. 1992). Table 4 shows history of Meal and Snack intake in study groups , dinner was the least frequently regular consumed meal (17.9%) , followed by breakfast (28.9%) and Afternoon snacks were the most commonly regular consumed snack in all obese females participate in this study(40.5%) , followed by midmorning and evening snacks (24.2%), nocturnal snacks (11.1%) . In examining regular meal consumption, (57.5%) of obese group with eating disorder Reported eating lunch meal regularly and (12.5%) breakfast meal regularly compare with (33.3%) in obese

without eating disorder group with statistical significant difference between two groups ( $\chi^2=9.064$ ,  $df=2$ ,  $p$ -value=0.011)

Other studies were inconsistent in regards to the relationship between binge eating behaviors and the consumption of specific meals and other finding in adults that report binge episodes are negatively correlated with evening meals only (Masheb RM, Grilo CM, 2011, Masheb RM, Grilo CM. 2006& Harvey K, Rosselli F, Wilson GT, et al 2011). obese women with eating disorders reported consuming more afternoon snacks regularly (60%) than those without eating disorders group(35.3%) with statistical significant difference between two groups regarding history of regular snack intake ( $\chi^2=9.482$ ,  $df=3$ ,  $p$ -value=0.024). This finding suggests that the afternoon, likely the after-work time frame, may be a particularly vulnerable time for snacking among women with eating disorders . It is possible that the afternoon is a time when these women are alone, devoid of social interaction and with limited family member control over food consumption. Furthermore, if the afternoon snacking reported by these women with Bing eating and bulimia nervosa overeating or psychological distress, this may make to helping these women to find alternative reinforces during this time period of the day (Fairburn, CG.; Marcus, MD1993, Pereira MA, Erickson E, McKee P, et al.2011). More studies are needed to determine what role, if any, specific meal consumption plays in the promotion or reduction in disinhibited eating behaviors among obese persons. Further research should focus on the role that meal and snack patterns may play in the development of adverse eating and weight outcomes.

Limitation of this study: the sample was comprised of a convenience sample of obese females that were relatively small who come to nutritional clinic willing to participate in weight loss program. Therefore participants may differ from other obese women in the general population. It is unclear whether the obtained results are generalizable to people with these eating disorders who do not seek treatment or who seek treatment at non specialty clinics and were assessed by the same research evaluation team .This methodology should eliminate some potential selection and sampling confounds.

#### **5- conclusion:**

obese women with binge eating disorder and bulimia nervosa appear to report younger age, live in cities mostly married and had college and post graduate level of education that is different compared to obese women without binge eating and bulimic episodes. They are reported lighter body weight and body shape stressor and the majority of eating disorders group report no history of diabetes mellitus, they also prefer mixed and fatty meal and the majority of them reported consume lunch meal and afternoon snack regularly.

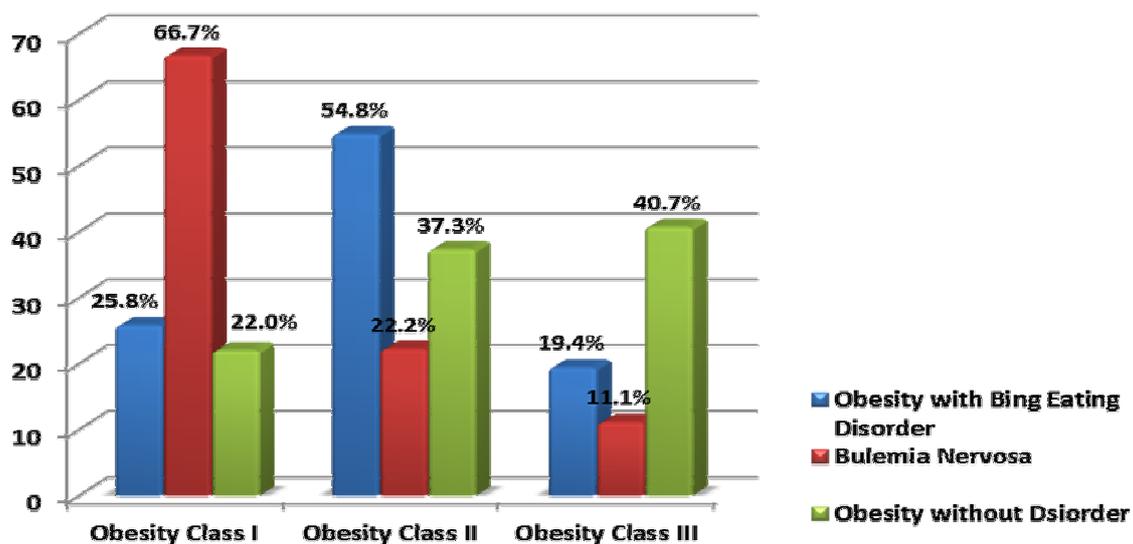
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**Hadeel F. Farhood : M.B.Ch.B-FICMS ,COMMUNITY MEDICINE** , Iraq, Babylon ,1975,  
 assistant professor in community medicine and public health, lecturer in nutrition in medical college of Babylon university , become fellow in Iraqi community medicine board., M.B.ch.B 1998-1999, F.I.C.M.S(COM)2006.



FIGER 1:Obesity Classes in study's' participants.

TABLE 1: Frequent distribution of study groups with binge eating disorder , bulimia nervosa and obese without eating disorder

subject	frequency	Percentage (%)
Obese with Bulimia Nervosa	8	4.23
Obese with Bing eating disorder	32	16.84
Obese without eating disorders	150	78.9
Total	190	100

TABLE 2: Characteristics of study population , by age groups , residence, occupation, marital state and educational

variable	Obese with eating disorder N (%)	Obese without eating disorders N (%)	Total N (%)	$\chi^2$	df	p-value
Age groups(years)						
15-25	8(20)	18(12)	26(13.7)	14.872	3	0.002
26-35	18(45)	54(36)	72(37.9)			
36-45	11(27.5)	21(14)	32(16.8)			
46-60	3(7.5)	57(38)	60(31.6)			
Residence						
Urban	31(77.5)	71(47.3)	71(47.3)	11.558	1	0.002
Rural	9(22.5)	79(52.7)	79(52.7)			
Occupation						
Employed	21(52.5)	68(45.3)	89(46.8)	0.651	1	0.420
Housewife	19(47.5)	82(54.7)	101(53.2)			
Marital state						
Married	18(45)	44(29.3)	62(32.6)	9.698	3	0.021
Devised	9(22.5)	21(14)	30(15.8)			
Widow	4(10)	10(6.7)	14(7.4)			
Unmarried	9(22.5)	75(50)	84(44.2)			
Educational level						
Illiterate	10(25)	33(22)	43(22.6)	6.676	2	0.036
Primary, secondary	9(22.5)	66(44)	75(39.5)			
College, postgraduate	21(52.5)	51(34)	72(37.9)			

$\chi^2$ , chi-squared test. df ,degree of freedom. p- value <0.05 was significant

TABLE 3: Distribution of study groups according to health related factors

variable	Obese with eating disorders N(%)	Obese without eating disorders (%)N	Total N(%)	$\chi^2$	df	p-value
Obese(BMI $\geq$ 30Kg/m <sup>2</sup> ) Class I:30-34.99 Class II:35-39.00 Class III: $\geq$ 40	14(35) 19(47.5) 7(17.5)	33(22) 56(37.3) 61(40.7)	47(24.7) 75(39.5) 68(35.8)	7.720	2	0.021
Sleep disturbance Yes No	15(37.5) 25(62.5)	68(45.3) 82(54.7)	83(43.7) 107(56.3)	0.788	1	0.375
Menstrual disturbance Yes No	22(55) 18(45)	66(44) 84(56)	88(46.3) 102(53.7)	1.537	7	0.215
Blood pressure >90/140 or on treatment Normal	17(42.5) 23(57.5)	81(54) 69(46)	98(51.6) 92(48.4)	1.672	1	0.196
Diabetes history Yes No	10(25) 30(75)	80(53.3) 70(46.7)	90(60) 100(40)	12.66	1	0.000
Chronic stress -Work , money related stressor -Body shape stressor -Relationship stressor -others(moves, tutors event, death in family, premature separation of parent)	6(15) 21(52.5) 3(7.5) 10(25)	42(28) 35(23.3) 22(14.7) 51(34)	48(25.3) 56(29.5) 25(13.2) 61(32.1)	13.256	3	0.004

$\chi^2$ , chi-squared test. df ,degree of freedom, p- value <0.05 was significant

TABLE 4: Distribution of study groups according to food related factors

variable	Obese with eating disorders N(%)	Obese without eating disorders N(%)	Total N(%)	$\chi^2$	df	p-value
<b>Favorite food</b>						
-Sweet, chocolate, juice, Beverage	10(25)	88(58.7)	98(51.6)	14.926	2	0.001
-Fruit, vegetables	4(10)	10(6.6)	14(7.4)			
-mixed meal, fatty meal	26(65)	52(34.7)	78(41)			
<b>Meal intake</b>						
Breakfast	5(12.5)	50(33.3)	55(28.9)	9.064	2	0.011
Lunch	23(57.5)	78(52)	101(53.2)			
Dinner	12(30)	22(14.7)	34(17.9)			
<b>Snack intake</b>						
Midmorning	6(15)	40(26.7)	46(24.2)	9.482	3	0.024
Afternoon	24(60)	53(35.3)	77(40.5)			
Evening	5(12.5)	41(27.3)	46(24.2)			
Nocturnal	5(12.5)	16(10.7)	21(11.1)			

$\chi^2$ , chi-squared test. df, degree of freedom, p- value <0.05 was significant

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