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### RESEARCH ARTICLE

#### PREVALENCE OF BULIMIA NERVOSA: A CROSS-SECTIONAL STUDY

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#### Abstract

**Purpose:** The study examines the prevalence of Bulimia nervosa in students at King Abdulaziz University in Saudi Arabia. Bulimia nervosa is an eating disorder characterized by consumption of large amounts of food by an individual followed by an attempt such as self-induced vomiting, long periods of exercising, and diuretics to avoid gaining weight.

**Patients and Method:** The study adopted a cross-sectional survey among King Abdulaziz University students in Saudi Arabia. A sample of 499 comprising 357 females and 142 males was randomly selected. Participants—the age of the sample population aged between 20 to over 55 years. The participants filled questionnaires about eating behavior, smoking, body image, and **psychiatrist disorders**. The height and weight of the sample population were taken, and their BMI was established.

**Results:** Based on our statistics, the prevalence of bulimia nervosa among the male was 0.3%, and that of the female was 1.4%. Extra observation revealed that those with mild or severe disorders were equally susceptible to depression and mood swing problems. The prevalence of Bulimia nervosa based on ages showed 80/50000 at 10 - 30 years and 145/50000 at 31 – 80 years. The clinically prescribed healing period was idealized to be one year.

**Conclusion:** The results show a comparatively high rate of BN among young people aged between 20 and 25, as reflected among King Abdulaziz University students in Saudi Arabia. Therefore, there is a need to increase public awareness about BN and other eating disorders in Saudi Arabia.

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**Introduction:-**

Rosten & Newton (2017) mentioned that eating disorders are possible life-threatening mental health disorders affecting patients' association with food and their bodies. The disorder is demonstrated through conditions and disordered eating habits. Bulimia Nervosa (BN) is one of the eating disorders with a lifetime prevalence of 1%. Bulimia is a severe, possibly life-threatening eating disorder (Bagaric et al. 2020). Individuals with BN may covertly engage in binge eating when they lose their control over the eating and induce vomiting to get rid of the excessive food. BN has been found to occur mostly among young women and is characterized by binge-eating and inappropriate compensatory behaviors such as smoking to reduce weight gain (Chao, White & Grilo, 2016; Schmid et al., 2016). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), patients with bulimia nervosa eat portions more significantly than many would eat in the same duration under similar conditions. When eating, the patient does not have control of his/her eating and cannot limit what he/she is consuming. This article aims to examine the Prevalence of Bulimia Nervosa, focusing on Saudi Arabia.

**Prevalence of Bulimia Nervosa:**

Bulimia Nervosa is associated with recurring incidents of eating a significant portion of food (binge) with related loss of control and unsuitable compensatory behavior (for example, self-induced vomiting, excessive exercising, or fasting) and overvaluation of weight and shape (Keski-Rahkonen & Mustelin, 2016; Litmanen, et al. 2017; Bagaric, et al. 2020). These binge eating incidents coupled with compensatory behavior have been found to occur at a minimum regularity of once per week in three months, though at times, they appear twice per week in three months (American Psychiatric Association, 2013). Some individuals suffer from partial BN, which is characterized by subjective binge moments and loss of control. Still, individuals do not consume objectively significant portions of food (Le Grange, Loeb, Van Orman & Jellar, 2004; Eapen, Mabrouk & Bin-Othman, 2006). Expulsion frequency among both groups was the same, indicating that the occurrence of losing control could be more noticeable compared to the quantity of food consumed. Cases of the diagnostic crossover are also common, particularly among young people, with many who at first presented sub-threshold (partial BN) advances to meet complete diagnostic criteria for BN. Hail & Le Grange (2018) noted this kind of diagnostic fluidity indicates that clinical management should be the same among sub- and full-threshold BN.

Among people with BN, the high degree of comorbidity makes it possible that teenagers may show treatment for a different disorder, such as anxiety disorder, while also experiencing binge eating and purging (Thomas, Khan, Abdulrahman; 2010; Kazim & Karavetian, 2017). Hail & Le Grange (2018) mentions that diagnostic assessment and continuous checking of progress could present opportunities to discover BN's clinically significant symptoms.

**Literature Review:-**

In a study, Anzengruber et al. (2006) examined smoking in eating disorders. They found that women experiencing eating disorders and who are smokers reported higher nicotine (cigar rate) dependence than those who did not smoke. These results show the broad inclination of women with BN to be at risk of cigar use and other substance use disorders (O'Brien, et al., 2017). Kendzor et al. (2009); Hales et al. (2017); Solmi et al. (2016) agree that many women suffering from BN trust that smoking reduces appetite and could be a convenient way of controlling appetite and weight.

Fatima, Fatima, & Anwar (2018) like (Aljomaa, (2018) established that students with low and high BMI (body mass index) were at a higher risk of disordered eating than those with BMI scores. The study concluded that body image disturbance was the most robust factor in eating disordered behavior, including BN. A similar study was carried out by Alihaibi (2015), who also reported that in Makkah Al-Mukarramah, Saudi Arabia, the underweight student had the highest eating disorders at 29%.

Alwosaife et al. (2018) also studied eating disorders among female students at the Imam Abdulrahman bin Faisal University in Saudi Arabia. They reported that 29% of the sample population was at an increased risk of eating disorders. The finding of Alwosaife et al.'s (2018)'s study, mirrors that of Taha, Abu-Zaid & Desouky (2018) indicating that eating disorders such as BN are not limited to a particular culture. Campbell et al. (2011); Yao, et al. (2019) has suggested that the eating disorder risk, including BN, is partly caused by the environmental and partly caused by genetic. Thus, eating disorders may be inherited from family member.

Ahmed et al. (2019) in their study on night eating syndrome among undergraduate medical students in Saudi Arabia found a prevalence rate of 10% among the participants instead of 0.5 to 1% found in the general population. This finding echoes that of Alwosaife et al. (2018) who also found a high prevalence rate of eating disorders in female students that expected.

Melisse, de Beurs & van Furth (2020) noted that the high prevalence rate among young people being observed in Middle East countries is caused by various factors that include high socioeconomic status, genetic admixtures, rapid nutritional transition, and physical inactivity.

Goodman, Heshmati & Koupil (2014) found that a family history of eating disorders seemed to have a prevalent effect on all forms of eating disorders. Machado et al. (2014) established that women with anorexia nervosa reported considerable high rates of negative attitudes about parents' shape, perfectionism, and concerns regarding being oversized and BN's family history. Therefore, as noted by (2007) genetics is a risk factor for BN, and critical comments regarding body shape and eating seem to precipitate anorexia nervosa and BN.

Alwosaife et al. (2018) also carried a study on eating disorders in Saudi Arabia. They reported that 29% of Saudi female course in the Imam Abdulrahman bin Faisal University was a risk of eating disorder. Alwosaife et al. (2018); Musaiger et al. (2013) study indicate that eating disorders such as BN are not limited to a particular culture.

In a study by Goodman, Heshmati & Koupil (2014), it was established that a family history of education seemed to have a pervasive effect on all forms of eating disorders, including BN. Similarly, Machado et al. (2014); Mousa et al. (2010); Anitha et al. (2019) established that women with anorexia nervosa reported considerable high rates of negative attitudes about parents' shape, perfectionism, and concerns regarding being oversized and BN's family history.

## **Materials and Methods:-**

### **Use of a questionnaire to screen eating disorders:**

This study adopted a cross-sectional survey among King Abdulaziz University students in Saudi Arabia, using a sample size of 499 comprising 357 female and 142 male participants. The age of 20 and above 55 years (mean = 45 years, S.D = 0.82), we used five questionnaires (n = 499) produced a sample of 499 responders of whom 357 were female while 142 were male. The screening entailed self-report questions to determine the samples current height, weight, and the corresponding maximum and minimum for the parameters. Purging was assessed in accordance to the DSM-III criteria by use of questions with answer that distinguished recent recurrent purging (for a minimum of three months) from previous recurrent attempt to purge, once in a while attempt to, and not attempting purge at all. Urine tests were also undertaken to establish the level of sugars in the body of the sample participants. Other habits such depression, smoking and the way people viewed themselves were determined by the use of three subscales obtained from Eating Disorder Inventory. All participants who proved negative for the screen test (n = 300), plus those who did not (n=199) were interviewed.

### **Use of Interviews:**

The interviews were administered on an open area (tents) to acquire recent and long-term identification of BN to determine if the participants have ever suffered eating disorder, and specifically if it was BN. The inter-rater for the diagnosis was impressive (mean  $k=0.78$ , range 0.67–1.00). The interview was conducted and facilitated by highly trained clinicians (four MDs and two RNs) who are again lecturers at King Abdulaziz University in Saudi Arabia. Generally, the participation rate was 83.75% (90.6% for the screen-positive and 76.9% for the screen negative). Only 11 respondents (2.2%) rejected the interview.

### **Instrument:**

The questionnaires used entailed demographic background, 40 items from the Eating Disorder Inventory, demographic information (age and gender), and questions on eating habits concerning BN.

## **Results:-**

### **Prevalence and incidence:**

**Weight and height:**

The mean height and weight for the sample used were 1.57m and 63.49kg for females and 1.72m and 75.63 kilograms for males. We only found 12% of females and 10% of males to be overweight based on the World Health Organization definition of overweight. But when questioned personally, 40% of females and 24% of males classified themselves as overweight. Also, we discovered that 60% of women and 40% of men were always, often, or very often afraid of gaining excess weight.

**Purging and Binge-eating:**

The selected King Abdulaziz University students were asked whether they binged, and if yes, how frequently. They gave descriptions of foods they consumed during binges. We set aside those who binged but used little or balanced diets. For instance, there were cases where others considered consuming 3 packets of biscuits as a binge, which did not meet the standards. Our research revealed that 60% of women and 35% of men were eating binges. Moreover, 75% of the female and up to 40% of males reported having used self-induced vomiting, diuretics, fasting, or laxatives as a form of avoiding losing weight. When queried on how they felt about their behaviors, 60% of the female and 45% of the male reported that they were very worried about it. Similarly, 30% of the females and 26% of the male reported feeling despair as they thought that their condition was out of control. Up to 56% of the male who was severely affected by the disorder were discovered to be drug abusers such as alcohol to help escape from the condition's reality. Up to 70% of the female found either partially or entirely affected by Bulimia nervosa were discovered to retain the body image issues long even after recovering. The recovery rate among the 10-30 years was approximately 3.2% higher than that of the other age brackets.

**Statistical analysis:**

BN prevalence (53.1%) was obtained through determining the division between the cases of positive prevalent incidences of BN and the total number of people who tested positively in the eating disorder across all years (n=499). Similarly, rates of incidence obtained showed that people at the highest risk of suffering BN were those aged below 25 years, and those between (20–35 years). In addition, our team determined the various rates of incidence for the whole age category that was at risk (10–35 years). We did this by dividing the number of incidents of BN established to that of the number of people in totals within the same age distribution. Owing to the fact that not all of the participants had attained age 35 (the mean age of sample population was 35 years, Standard deviation =1.82 years, distribution 20–35 years). The 12 months rate of clinical recovery was calculated by the help of Kaplan–Meier method. We also analyzed the psychological results after clinical recovery by finding the mean psychological results and 97% confidence intervals (CIs) of means for cases of BN who happened to be recently suffering from the disorder. Our p-value was 0.08 and CIs 97% which we determined using Excel spread sheet used for analysis,

**Discussion:-**

Bulimia Nervosa (bulimia) is a serious eating disorder in which individuals suffering from the disorder secretly eat higher portions of food when out of eating control and intentional engage in vomiting or other means of removing the excessive food. The prevalence of young females suffering from BN is higher compared male because of they are more concerned about their body shapes and weight (Zainal, Ng & Lee, 2017). Many studies based on population have focused on young people who meet complete-threshold criteria for an eating disorder without underlining cases that may have a clinically substantial presentation. However, they fall under the diagnostic level. American Psychiatric Association (2013) observed that among adults, the prevalence rate of BN is estimated to be 1% to 1.5 percent, though among the youth, the percentage increases to 2%. Nonetheless, community studies that have examined disorder eating behavior without applying DSM criteria have found higher prevalence rates of up to 20% (Hail & Le Grange, 2018). This prevalence rate agrees with the findings of Alluhaibi (2015), who also reported that underweight student had the highest eating disorders at 29% in Makkah Al-Mukarramah.

In the present it was revealed a higher number of male students had engaged in smoking as opposed to female. Indeed, a study by Solmi et al. (2016) underlined that smoking was an approach used by individuals with BN as a way of reducing their appetite in order to reduce their food intake. Other methods used to prevent BN include fasting, vomiting, diuretics and laxatives. However, the findings of the study as shown in Table 4 (see Appendix) show that the participants hardly used vomiting as a way of reducing weight, but a few used diuretics and fasting. Our research found that fasting was the most familiar compensatory method to avoid gaining weight because it was easier for the Saudi Arabians who are Muslims and therefore do not mind regular fasting since it is part of their culture and religious practices. .

Similarly, the study revealed that 75% of the female and up to 40% of males had used self-induced vomiting, diuretics, fasting, or laxatives as a form of avoiding losing weight. This was consistent with a previously documented study by other researchers such as Alwosaife et al. (2018), who also found high eating disorders among students in the Imam Abdulrahman bin Faisal University. Table 5 (see appendix) shows that women are the most affected and tend to use purging methods such as fasting, to avoid weight gain. The study as well revealed that a higher proportion of females had a prior knowledge about BN, underlining the fact that they are more worried and concerned about their physical image, hence many of them seek knowledge on eating disorders. This finding agrees with the previous study of Fatima, Fatima, & Anwar (2018) who established body image disturbance was the most robust factor in eating disordered behavior, including BN, hence the reason why concerns about body image may contribute to BN.

Inherited traits also featured to some extent but not so common, underlined similar results by Campbell et al. (2011) who suggested that the eating disorder risk, including BN is partially contributed by genetics. This means that an individual can still tame their appetite if they commence earlier. Generally, our findings showed that women are up to 1.5% more likely to develop the disorder than men. The Saudi health authorities need to increase its public health awareness on eating disorders to educating people on the dangers of these disorders and how best they can be prevented.

Based on the finding of the study, there is need to consider screening and formulating health intervention associated to eating disorder in Saudi Arabia. The high prevalence rate among young people being observed in Saudi Arabia is caused by various factors that include high socioeconomic status, genetic admixtures, rapid nutritional transition, and physical inactivity. Certainly, eating disorders entail a noteworthy health concern among college and university students. Accordingly, colleges and universities should have programs on eating disorders included in their educational services in an effort to reduce potential risk factors as well as unhealthy behaviors and attitudes. Generally, these findings suggest that there is need to have a suitable preventive interventions aimed at promoting healthy life style and body size acceptance particularly among young female students who have been found to be at higher risk compared to their male counterparts.

### **Conclusion:-**

Eating disorders were initially believed to be experienced mainly in wealthy Western countries; epidemiological data show that eating disorders are more and more being reported globally in the last two decades happen across all cultures, socioeconomic and ethnic groups. BN appears more prevalent among young Saudi people, particularly females, concerned about their body shapes. Therefore, BMI is a factor that contributes to BN, as people with high or low BMI are likely to experience BN. In examining the prevalence level among students faculty of medicine, King Abdulaziz University, the finding has revealed that the prevalence rate was considerably high, underlining that eating disorders are on the increase. Other factors increase the risk of suffering BN, such as genetics, family history of BN, and social-economic status. Smoking has been used by individuals with BN as a method of reducing their appetite for them not to indulge in excessive food consumption due to BN. Smoking may be viewed as compensatory behavior because nicotine inhibits appetite, fuels motivation, and could modulate eating or control weight. Smoking may be associated to both compulsive and impulsive personality traits and behaviors established to be part of BN's behavioral and relational pattern.

Presently, there is little data that can be applied in systematic the treatment of BN as an isolated disorder. Guidance is also missing regarding whether concurrent or consecutive treatment strategies for comorbid diagnosis are most effective or appropriate. However, it is still uncertain why BN treatment among the younger population is still behind in Saudi Arabia. Altogether, the limited systematic assessment and concomitant advancement of treatment approaches for young people leave practitioners with a limited range of treatment options. The fact that a significant percentage of college and university end up with BN underlines the changing eating behavior among the young people that is brought about by changes in life-style and socio-economic factors. Accordingly, the high relevance of BN among young people in Saudi Arabia calls for increased public awareness campaigns on eating behavior.

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## Appendices:

### Appendix 1:

**Table 1:-**Age and gender of the sample tested.

Age bracket	Male	Female	Total sample (n)
Below 25	55	120	175
25- 30	52	75	127
31-35	13	39	52
36-40	6	43	49
41-50	10	63	73
Above 50	6	17	23
Total sample, n used = 499			
Male = 142			
Female = 357			

### Appendix 2:

**Table 2:-**Average Weight and height.

Gender	Average weight (kg)	Average height (cm)
Male	75.63	172.55
female	63.49	157.72

### Appendix 3:

**Table 3:-**Other categories used to classify the sample.

GENDER	Smoker		Prior knowledge		Genetic history		Ever experienced nervous shock.		Been diagnosed with psychiatrist disorders	
	Yes	no	yes	no	yes	no	yes	no	yes	no
Male	67	75	62	81	46	97	35	108	92	50
Female	17	340	180	177	116	242	101	256	38	319

**Appendix 4:****Table 4:-**Compensatory weight loss methods used by male respondents according to age .

Respondents	Fasting			diuretics			laxatives			vomiting		
	Never	In the past	Recent	Never	Not now	Recent	Never	Not now	Recent	Never	Not now	Recent
below 25 yrs.	81	8	11	98	2	0	100	0	0	96	4	0
(25-30)	80	7	13	96	3	1	99	1	0	94	4	2
(31-35)	81	9	10	95	4	1	97	3	0	94	5	1
(36-40)	78	10	12	97	2	1	96	3	1	93	4	3
(41-50)	77	8	15	93	4	3	96	1	3	92	3	5
Above 50	78	12	10	99	0	1	1	3	94	97	3	0

**Appendix 5:****Table 5:-**Compensatory weight loss methods used by female respondents according to age.

Respondents	Fasting			diuretics			laxatives			vomiting		
	Never	In the past	Recent	Never	Not now	Recent	Never	Not now	Recent	Never	Not now	Recent
below 25 yrs.	54	21	25	96	3	1	92	3	5	96	3	1
(25-30)	55	23	22	96	3	1	93	4	3	94	4	2
(31-35)	52	24	24	95	4	1	93	3	4	94	5	1
(36-40)	48	25	27	97	2	1	96	3	1	93	4	3
(41-50)	56	24	20	93	4	3	93	4	3	90	7	3
Above 50	59	25	16	94	3	3	93	5	2	89	7	4