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## Article

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## **Link between Eating Disorders and Depression**

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### **Abstract**

The present research sets out to gauge the interdependence between eating disorder risks (Dieting, Bulimia & Oral Control) and prevalence of depression among undergraduate students of higher learning institute of Pakistan (The Islamia University of Bahawalpur). After A-priori testing, 70 students from each faculty of respective university were recruited conveniently, and sample of three hundred fifty (N = 350) university students was taken. The total participants were equally divided into two categories of one seventy five (n = 175) for each gender. Two scales were employed to collect the data. First, Beck Depression Inventory (BDI-II) that is developed by Beck in 1996 with copyright® of Beck Corporation, and Second, Eating Attitude Test (EAT-26) evolved by Garner et al. (1982) were employed. Reliability and Validity were found to be 0.82 and 100% respectively. Split-half reliability statistics, regression analysis, standard deviation, t-Test, and mean were employed to process the results. Overall findings of study depict that both eating disorder and depression are interdependent on each other. Conclusively, the level of depression in students of arts faculty was found higher than rest students of all four faculties. Furthermore, it was also found that female students are more vulnerable toward depression and eating disorder than male students of the Islamia University of Bahawalpur, Pakistan. This study would provide base line to youth researchers working in context of Pakistan. Limitations and suggestions are enclosed in the study.

**Keywords:** eating disorder risks, depression, gender differences, university students, Pakistan.

## 1. Introduction

Globally, health of the youth is the core issue being studied by health care professionals in general and mental health in specific. World Health Organization (WHO, 2011) reported that 10% youth (adolescents) face psychological or behavioral problems in their life span. There are variety of disorders that can prevail in young people by influence of genetics, habituation and preferences. Depression and eating disorders are most prevalent in young people worldwide; depression currently estimated as the fourth leading etiology of disability and anticipated that it will become the second progressive cause of illness by 2020 throughout the world (WHO, 2011), similarly, Renfrew Center Foundation for Eating Disorders (2003) estimated 24 million individuals bear eating disorder problems worldwide. Wade and Hudson (2011) suggested that in the United States 20 million females and 10 million males have diagnosed with disorganized eating patterns at one time in their lives.

In case of Pakistan, there is increase in eating disorders especially in female populations (39%), that are predominant in South Asian and Islamic countries (Ali & Awais, 2002). According to Rehman, Siddiqui (2003) and Safdar (2006) women are overweight in Pakistan. A research conducted by Choudry and Mumford (1992), reported significant ratio of bulimia patients in Lahore, Pakistan, same as in Mirpur (Azad Kashmir) obesity is reaching at its peak. Other studies conducted in Pakistan (Kaiser & Qazi, 2007; Suhail & Nisa, 2002) identify the relationship of eating disorders with depression.

Eating disorders, characterized by anorexia nervosa and bulimia nervosa (WHO, 2000) are serious somatic and mental-health problems prevailing substantially in young adulthood or adolescence (Preti et al., 2009), specifically in youth females. The term 'eating disorder' relates to instant alarms of eating behavior that consequence in smashed mental or bodily functioning (Eisenberg, 2011). Period of danger for disturbances in eating behaviors happens in 10-24 years of lifespan. (Currin, Schmidt, Treasure & Jick, 2005). The Diagnostic and Statistical Manual of Mental Disorders (DSM-V, 2012) also focus symptoms of eating disorders vividly.

Tiggeman and McGill (2004) concluded most astounding occurrence of eating problems are seen in teenagers and youth, consequently body disappointment and disordered eating are issues faced predominantly by the females as compared to male population. Crisp (2005) noted as eating disorder identifies body disappointment and the intra-personalization of smartness accepted. Body dissatisfaction may be defined as - body physique regarding to mass, heaviness, shape, abdomen are negatively estimated (Stice & Shaw, 2007). Commonly the dissatisfaction of body, for all the females belong to all ages is a prescriptive issue, in spite of the fact that many pre-adult young girls and females having healthy weight are seemed to have dissatisfaction with their bodies diet (Dunkely & Paxton, 2001). Features of irregular eating patterns in females have been repeatedly discussed in literature but a very limited data has been found for dietary issues in males (Anderson, 2000).

Depression is a recognized mental health problem that adversely impact upon the individual's ability to function and sufferer's daily life (National Institute of Mental Health, 2014). Due to depression, society has bearing considerable economic costs, because thousands of sufferers fail to perform social and occupational functions as a consequence of episodic symptoms of depression (Andrade et al., 2003; Birnbaum,

Kessler & Greenberg, 2010). The age period to young adulthood has been identified as the typical age of onset for the initial episode of depression (Kuehner, 2000; Marcus et al., 2005). The World Health Organization (2002) places depression as the world's more brutal disease and highlights the necessity to identify vulnerability factors in order to understand, prevent and treat its course.

According to Goldbacher and Mathews (2009) Psychological characteristics, particularly depression is linked with inclination for obesity and weight gain. A most prevalent mental health problem in the world is depression, and it is considered more prevailing in women than in men (Chen, Jiang, & Mao, 2009). Depression patients have a higher rate of body mass index (BMI) and eating disorder than patients without depression (Zhao et al., 2009).

Common features of eating disorder problems are social withdrawal, insomnia, irritability, confusion, depressed mood (feeling hopeless, guilty, and worthless) and impulse control difficulties (Abraham & Liewelly Jones, 2001). Risk factors associated with eating disorder symptoms include negative effect, decreased self-esteem, negative body image or body dissatisfaction, neuroticism, impulsiveness, depression and psychological distress (Rifhag & Morey, 2008; Fairbum, Cooper & Shahfran, 2003). Similarly, Heaven et al., (2001) noted that when people are depressed they eat more which might be an attempt to mold these negative feelings and depression may also relate to external eating.

Disapproval with one's own body weight is an emotional part of body image which dissimulates diet behaviors, tension, depression, bulimia symptoms, low self-regard (Johnson & Wardle, 2005). In disorganized patterns of eating, and negative mood proves to be the significant feature. However, according to a large body of research, low mood arises greatly due to body disapproval and depression that theorizes depression may cause body dissatisfaction because usual negative feelings are conducted into negative emotions about body physique and mass (Keel, Mitchell, Davis & Crow, 2001; Keel et al., 2001).

Moreover, eating disorder preoccupation with mass, body image, body dissatisfaction and self-perception turmoil's are more accepted among females than males; young females showed greater dissatisfaction with their weight than men, dieting most additionally and substantiate more irregular eating patterns than men, especially in youth adolescence (Jarry, 1998). The over-evaluation of the idiomatic suggestions about body shape and mass coupled with body dissatisfaction and maladaptive beliefs about eating and weight, depression and low self-esteem are more common in women (Garner & Bermis, 1982; Vitouselc, 1996). Rozin and Fallon (1988) noted that depression was being caused at a great rate due to the traditional view for smartness among women because Body dissatisfaction is directly caused by the feminine traditional ideal of smartness which is usually much below the average ideal mass. According to Drewonwski and Yee (1987) reported that key difference between gender manifestation and procession of eating disorder may be related to the actual behaviors surrounding diet and exercise rather than just dissatisfaction with their body weight. There is a greater difference between women diet pattern and their current desired body weight because women are more concerned with diet than men and their desire for thinness is directly correlated with frequency of dieting.

An elevated level of depression among clinically cured adolescence has been reported (Emmons, 1996). There is a correlation between a disapproved image of own body mass

and depression. Depression increases both the occurrence and danger of eating disorder (Markowitz et al., 2008) and high level of abdominal obesity were linked with higher depression scores (Dunbar et al., 2008). The association of eating disorder and depression has found frequently in females as compared to males (Chen et al., 2009). Therefore the current study helps to understand that depression and eating disorder risks are mutual significant predictors of each other.

### *1.1 Objectives of the Study*

- i. To measure eating disorder risks and depression are mutual significant predictors of each other.
- ii. To assess the overall level of interdependence of eating disorder risks and depression among all sampled population.
- iii. To measure gender differences in depression and eating disorder risks.

## **2. Hypotheses of the Study**

- **H<sub>1</sub>:** It was assumed that eating disorder risks and depression would mutual significant predictors of each other.
- **H<sub>2</sub>:** It was anticipated that overall level of interdependence of eating disorder risks and depression among all sampled population would high
- **H<sub>3</sub>:** It was hypothesized that gender differences in depression and eating disorder risks would be higher in females

## **3. Methodology**

### *3.1 Research Design*

In this study cross-sectional survey design is being used to measure and establish the link between eating disorders risk and its relation with depression.

### *3.2 Participants*

A total of 350 participants were approached to participate in current study from the higher learning institute of Pakistan (The Islamia University of Bahawalpur). Participants were recruited above the age of 18 years. Eating disorder risks and prevalence of depression are assessed among two samples, 175 males and 175 females. First of all participants completed demographic sheet and then both self-reported questionnaire are filled.

### *3.3 Sampling Procedure*

All participants were undergraduate students. A sample of (N= 350) participants were comprised for the study. For this study, convenient sampling was being used to recruit the participants. Eating disorder risks and prevalence of depression were being gauged in the male and female population. Participants in the current research were being informed to fill the questionnaire voluntarily. Participants were given the questionnaire of Eating Disorder (EAT-26) which was used for screen eating disorder symptoms and depression (BDI-II) which measures the primary characteristics of depression. Participants were reasoned with reference to the confidentiality of their answers and their prior permission was acquired to become a part of this research. After completed all the questionnaires, incomplete questionnaires were excluded from the study.

### 3.3.1 Sample Size, Power and Precision

The sample size was comprised of 350 undergraduate students of the Islamia University of Bahawalpur, Pakistan. The total participants were equally divided in two groups. 70 respondents were approached from five different faculties of the University. These faculties were Faculty of Science, faculty of Management Sciences, faculty of Pharmacy, faculty of Arts. Sample size was being determined through A-priori sample size calculator for the purpose of multiple regressions (Soper, 2013). This Calculator was used to know the minor demand sampler size for a multiple regression study, given the expected probability level, the number of forecast factors in the model, the desiderate effect size, and the desired statistical power level. So by providing the essential demand rules, the lowest number of sample necessary for the study would be told by this statistical calculator. Anticipated effect size ( $r^2$ ) = 0.15, Desired statistical power level = 0.8, Number of predictors = 2, Probability level = 0.05, and minimum required sample size = 67. Minimum sample required for the research was 67 but study takes the sample of 70 to minimize sampling bias in the current study.

### 3.4 Statistical Data Analysis

We use the Statistical Package for Social Sciences (SPSS) version 19.0 for the data analysis, t-Test, regression analysis, split half reliability; mean and standard deviation techniques were employed in the current study. According to the ideal assumption of data distribution, the variables were being verified. By considering all the data to be homoscedastic (variance of error term has been constant), having imperfection in linear correlation, variables were auto correlated, regression analysis was being used.

## 4. Measures and Covariates

Before administering, Eating Attitude Test (EAT-26) and Beck Depression Inventory (BDI-II) tools were translated by using forward backward translation method. An experienced panel of experts was engaged for the translation process that makes us able to reach nearly error free translated questionnaires in Urdu.

### 4.1 Eating Attitude Test (EAT-26)

The Eating Attitude Test (EAT-26) is the almost commonly used standard instrument that measures the symptoms of eating disorder risks (Garner, Olmsted, Bohr & Garfinkle, 1982). It was developed by © Garner et al., (1989). The 26-item version is extremely reliable and valid (Garner, Olmsted, Bohr & Garfinkle, 1982). The reliability of EAT-26 scale is ( $\alpha=.90$ ). In this research the internal consistency of EAT-26 was ( $\alpha=.82$ ) which is the sufficient reliability of all items used in the scale. The EAT-26 is used as an examining instrument to measure “eating disorder risk”. The test is ranked to six point scale in response to how much individual engage in particular behavior. The question may be answered by always, usually, rarely, sometimes, often and never. Three subscales of EAT-26 comprised of bulimia, dieting, and food preoccupation and oral control were observed in the population.

### 4.2 Body Mass Index (BMI)

Specific questions on height, weight and gender are including in EAT-26. These questions are used to accustom Body Mass Index (BMI) so you know about that if you are if you are “at risk” for an eating disorder. BMI scores show that if your body weight is highly overweight or underweight taken into account. BMI scores are tabulated to

divided weight of the participant in kilograms and height in meters. Although, according to Garner (1989) BMI is considered as highly reliable weight classification tool.

#### *4.3 Beck Depression Inventory (BDI-II)*

The BDI-II was a modification of BDI, developed in contrast to American Psychiatric Association publication of the Diagnostic criteria for Major Depressive Disorder, Fourth edition, which include many of the changes in the diagnostic criteria for Major Depressive Disorder. In the BDI-II items have been revised to show increases or decreases in sleep, changes in appetite, items labeled body image, weight loss, work difficulty, and somatic preoccupation were replaced with items labeled agitation concentration difficulty and loss of energy and many statements were renamed.

The BDI-II scale was developed by © Beck Corporation (1996). BDI-II is a widely used instrument in clinical and research measure for the diagnosis of depression. Beck developed the measure in order to make a difference between depressed and non-depressed individuals. The BDI-II comprises of 21 items or statements answered on a 0 to 3 scale of intensity of depressive issues. The cutoff scores used are 0-13 minimal depression; 14-19 mild depression; 20-28 moderate depression; and 29-63 severe depression. Elevated total score shows more severe depressive symptoms. The reliability of BDI-II scale is ( $\alpha=.91$ ). The internal consistency of BDI-II was ( $\alpha=.87$ ) in this research which shows the sufficient reliability of all items used in the scale.

Before terminal data collection, in pilot study, it was found that our all research tools were valid and several previous researches also prove the validity of this research tool too (Garner, Olmsted, Bohr & Garfinkle, 1982).

#### *4.4 Operational Definitions of Variables*

##### *4.4.1 Eating Disorder*

Eating disorders are described by a constant practice of serious disruption in eating pattern. It affects one's physical and emotional issues that will presiding to life-alarming results; it comprises bulimia, anorexia, extreme emotions, binge eating non-adaptive behaviors and attitude that comprise food and weight issues (National Institute of Mental health, 2011).

##### *4.4.2 Depression*

According to DSM-IV-TR (2000) and the basic symptom of depression is low mood and loss of excitement in pleasing activities .Other symptoms involve loss of weight, increase or decrease in appetite, disturbance of sleep, changes in an activity levels, loss of trust and self-respect, death, thoughts of self-destruction and reduce concentration.

### **5. Results**

The results of this study indicate relationship between eating disorder risks and depression. And over all the average prevalence of eating disorder and depression is elevated in females as compared to males.

**Table 1: Regression Analysis for Eating Disorder risks as Dependent Variable of Depression**

Model	R	R Square	Standard. Error	Regression Coefficient	P-value
<b>Eating Disorder</b>	0.322	0.103	9.325	0.395	0.000
Predictor (Independent variable) is Depression					

Note: The value of R-square is 0.103 and the regression coefficient is 0.395 with p-value 0.000 shows the significance of relationship at 5% level of significance.

**Table 2: Regression Analysis for Depression as Dependent Variable of Eating Disorder Risks**

Model	R	R Square	Standard. Error	Regression Coefficient	P-value
<b>Eating Disorder</b>	0.322	0.103	7.603	0.262	0.000
Predictor (Independent variable) is Depression					

Note: The value of R-square is 0.103 and the regression coefficient is 0.262 with p-value 0.000 shows the significance of relationship at 5% level of significance.

**Table 3: Faculty Wise Overall Descriptive Statistics of All the Variables**

Faculty	Eating Attitudes Test		Body Mass Index		Back Depression Inventory	
	Mean	S.D	Mean	S.D	Mean	S.D
<b>Overall</b>	15.09	9.83	22.89	4.01	12.93	8.01
<b>Arts</b>	14.39	10.28	22.91	4.12	14.21	8.18
<b>Education</b>	13.96	8.73	21.78	3.79	13.30	9.94
<b>Management</b>	16.64	10.51	22.97	4.13	13.40	6.79
<b>Pharmacy</b>	14.13	8.66	24.20	3.06	10.44	5.94
<b>Science</b>	16.36	10.70	22.60	4.53	13.30	8.32

Note: An overall average of eating disorder risks is 15.09 with std. deviation 9.834. The eating disorder risks of faculty of science are higher as compared to all others and eating disorder risks of faculty of education are smaller than all others. Overall average body mass index of all the population is 22.89 with std. deviation 4.01. The body mass index of pharmacy is higher and body mass index of education faculty is smaller than all others.



Overall average back depression inventory is 12.93 with std. deviation 8.01. The depression of faculty of arts is larger and pharmacy is smaller than all others.

**Table 4: Faculty Wise t-Test for the Comparison of Male and Female Population in Case of Eating Disorder Risks**

Faculty	Female	Male	T-value	P-value	Significance
<b>Overall</b>	20.52	9.67	12.367	0.000	Yes
<b>Arts</b>	18.50	10.03	3.758	0.000	Yes
<b>Education</b>	17.92	10.22	4.078	0.000	Yes
<b>Management</b>	23.88	9.81	7.523	0.000	Yes
<b>Pharmacy</b>	20.29	7.97	8.449	0.000	Yes
<b>Science</b>	22.06	10.32	5.454	0.000	Yes

$P < 0.05$

Note: Overall eating disorder risks of female are 20.52 and average eating disorder of male is 9.67. The t-score for overall population is 12.367 and p-value is 0.000 which shows the significance at 5% level of significance. Same as faculty wise comparison of male and female eating disorder risks of all the respondents is shown in the table. In all the faculties' eating disorder risks of female is higher than male population and significant at 5% level of significance.

**Table 5: Faculty Wise t-Test for the Comparison of Male and Female Population in Case of Depression**

Faculty	Female	Male	T-Score	P-value	Significance
<b>Overall</b>	15.26	10.60	5.678	0.000	Yes
<b>Arts</b>	15.75	12.59	1.635	0.107	Not
<b>Education</b>	18.65	8.250	5.102	0.000	Yes
<b>Management</b>	14.65	12.22	1.505	0.137	Not
<b>Pharmacy</b>	12.20	8.690	2.572	0.012	Yes
<b>Science</b>	15.14	11.35	1.940	0.057	Yes

$P < 0.05$

Note: Overall depression of female is 15.26 and depression of male is 10.60. The t-score for overall population is 5.678 and p-value is 0.000 which shows the significance at 5% level of significance. Same as faculty wise comparison of male and female eating disorder of all the respondents is shown in the table. In all the faculties' depression level of female is higher than male population. Except arts and management all other faculties are significant at 5% level of significance.

## 6. Discussion

The hypothesis was that eating disorder risks and depression are mutual significant predictors of each other. American Psychiatric Association (2006) stated that individuals having Eating Disorder risks found life time risk of Depression range between 50 to 75 %. Eating disorder risks patients reported 29 % of major depression (Halmiet *et al.*, 1991). In current research the regression analysis for the eating disorder risks as dependent variable of depression the value or R-square is 0.10 and the regression coefficient is 0.39 with p-value 0.000 shows the significance of relationship at 5% level of significance. Our current study also proves that depression is an influencer of eating disorder risks. Results support the hypothesis. The value or R-square is 0.103 and the regression coefficient is 0.262 with p-value 0.000 shows the significance of relationship at 5% level of significance. One study suggested that the range of eating disorder is 70 % in patients caused by depression (Rastam *et al.*, 1995; Halmiet *et al.*, 1991).

The hypothesis we also predicted in our current study is that overall level of interdependence of eating disorder risks and depression among all sampled population is high. The hypothesis was not supported. The results show that overall average of eating disorder risks is 15.09 and overall average of depression is 12.9. According to Schweitzer *et al.*, 2008, College undergraduate students have eating or weight related problems, its range lays 25 % to 40%. And students depressed that their eating is not in control and not related with their body weight and image. In the current research in one faculty the level of interdependence of eating disorder risks and depression is high not in all faculties that's why the hypothesis was rejected. By the second consideration, Herva and Laitinen *et al.*, (2006) have argued contradictory results, finding no link between eating disorder and depression

The hypothesis was that gender differences in depression and eating disorder risks are higher in females as compared to male respondents. The present research sheds light at the risk of eating disorder; the preoccupied insight body image and the dissatisfaction of body are more prominent in females than males. A greater dissatisfaction about the body weight has been found more among females and especially in youngsters; they usually do more dieting and having greater disorder of eating than men (Jarry, 1998). In the current research results shows that overall eating disorder risks of female is 20.52 and average eating disorder risks of male is 9.67. According to Atlantis & Baker, 2008; Chen *et al.*, (2009) the connection between irregular eating patterns and depression have found to be more in women as compared to men. The life span occurrence of Anorexia nervosa was 0.3 % between a national sample of adult males (Hudson *et al.*, 2007 ) and in young adults females the prevalence of AN is 0.5- 1% and the incidence of BN is 1-3 %.

Major Depression Disorder varies by gender, from 10 to 25% in population sample of women and from 5 to 12% in men (APA, 1994). In one study Rozin and Fallon (1988) stated that the idea of thinness for women in the society depression at a higher rates among women. In another study Blinder, Cumberland Sanathara (2006) found that 46% of females in patients with eating disorder also met criteria for major depression. Another study shows that depression and low self-esteem are more common in women (Garner & Bermis, 1982; Vitouselc, 1996). The current study shows that overall level of depression of female is 15.26 and depression of male is 10.60 that is low as compare to female. In all faculties the level of depression in female is higher than male.

## 7. Conclusion

According to the conclusion of recent study, there exists a relationship between eating disorder risks and depression. The existential to inquire the co-morbidity and temporal association between depression and patterns of eating disorder risks were cultivated. Overall results support the hypothesis. Females have more eating disorder and depression than males. Both disorders trigger to each other.

## 8. Limitations

- i. This study include the fact that all the data collected from non-clinical sample of university students which may differ from clinical eating disorder risk patients.
- ii. The presence of participant bias is also reported in this study.

## 9. Suggestions

- i. Study can be elaborated by drawing a large sample from different cities. It is suggested that the data should be taken from all over the Pakistan for more generalize results.
- ii. In depth the interviews should be taken for the better understanding of phenomena.

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