

# The Prevalence and Inter-Relationship of Negative Body Image Perception, Depression and Susceptibility to Eating Disorders among Female Medical Undergraduate Students

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## ABSTRACT

**Introduction:** Female students are thought to be more negatively impacted by body image ideals and often more susceptible to various eating related disorders compared to men. A previous study using a sample of female students in Malaysia did not identify whether the increase in susceptibility to eating disorders can be explained by the level of body image acceptance.

**Aim:** To identify the prevalence of depression and susceptibility to eating disorders among a sample of 206 female students in one of the private universities in Malaysia and explore the relationship between depression, body image and susceptibility to eating disorders. In addition, this study aimed to determine whether depression is a mediator between body image and susceptibility to eating disorders among female college students.

**Materials and Methods:** The Body Image Acceptance and Action Questionnaire were used to assess body image acceptance, the Patient Health Questionnaire to measure depression and the Eating Attitude Test- 26 was used to assess susceptibility to eating disorders.

**Results:** The results showed that 65.5% (=135) of the students were depressed and 6.3% (n=13) were susceptible to eating disorders. There was a significant positive relationship between depression and eating disorders and a negative relationship between body image and depression as well as between body image and eating disorder. Further, the regression model showed that depression was partially mediating the effect of body image on eating disorders.

**Conclusion:** Body image and depression contribute to eating disorders and treating depression could reduce susceptibility to eating disorders.

**Keywords:** Unhealthy body perception, Psychological problems, Relationship between body image and eating disorder

## INTRODUCTION

Body image is a person's perception of his or her own physical appearance and is an important psychological phenomena among females, as females are thought to place more importance to their body image. Body dissatisfaction, or the inability to accept one's body image, was reported more in women across all weight categories compared to men [1]. Early studies suggested that chronic dissatisfaction towards one's own body may trigger the development of eating disorders [2] and that these disorders are the leading contributor to death compared to other mental disorders [3]. Ayres, found that eating disorders occurred predominantly, 90 percent of them seen in women from industrialized countries where being thin is considered to be "attractive" [4].

Development of body image dissatisfaction and severe weight management techniques leads to unhealthy preoccupation, obsessions and distorted perception of body image [5]. In addition, having unrealistic expectations of one's body image increases the probability of body dissatisfaction and greater risk in developing eating disorders [6]. It is generally known that psychological disorders include various behavioural problems such as abnormal or disturbed eating habits, life-threatening extreme eating behaviours [7] and depression [8]. Eating disorders affect not only the patients psychological well-being but are also capable of harming patients physical health and may lead to fatal outcomes. One of the studies from Malaysia found that females had a significantly higher risk of eating disorders compared to male students [9]. Studies outside Malaysia also found that elementary school girls and female college students maintain strict dieting as they want to be thinner than their current perceived body image and fear being fat [10,11]. There is a need to identify the predictive factors for eating disorders among college students as no studies have been conducted in Malaysia. In

addition, individuals who are dissatisfied with their body image are prone to depression as there was a significant association found between body image dissatisfaction and depression. Further, studies have found that body image is associated with eating disorders and depression [5,8,9].

It is not unusual for an individual diagnosed with an eating disorder to also carry diagnoses of other psychiatric conditions such as mood and anxiety disorders. Depression is manifested by a constant feeling of sadness and lack of interest in pleasurable activities. Depression is one of the comorbid illnesses of eating disorders [12], resulting in an estimated 1 million deaths every year [13]. The relationship between depression and eating disorders is interrelated and bi-directional [14]. Depression leads to progression of eating pathology [14,15] and contrarily, improper diets and nutrition also can create chemical imbalances that play a significant role in causing certain types of depression [16]. In addition, earlier studies found that some of the highly distressed college students use life-threatening measures to control their weight, such as severe fasting, appetite suppressants, diuretics, or practicing purging after eating [17]. Despite this research, there is no definite answer as to whether depression leads to eating disorders and vice versa. Most studies proposed a significant positive correlation between depression and eating disorders [9,18].

Previous studies identified personal, psychological and sociocultural factors contributing to eating disorders. The predictive and correlated factors included being female [19], depression [15], low self-esteem [20], body image dissatisfaction [2, 21], severe dieting [22] and ethnic and cultural background [23]. Though, there are many predictive factors that predicted eating disorders, depression and body image are very closely associated with eating disorders. Researchers had previously identified body image as a predictor

of eating disorders [5]. Concurrently, depression leads to eating disorders, and students who are dissatisfied with their body image are sad about their appearance [14,15]. Theoretical models show that depression is a mediator for binge eating and calorie intake among women. In addition, Jonstang's [22] theoretical model describes depression as a mediator for body image and eating disorders among school children in Norway. However, no studies have been conducted among college students investigating whether depression is a mediator between body image and eating disorders. Therefore, the major aim of this study is to identify to what extent depression is a mediator between body image and susceptibility to eating disorders among female students in one of the private Universities in Malaysia.

As in other countries, Malaysian society places more emphasis on the females body weight and shapes compared to the men [24]. Based on the previous studies, the first objective of this study was to identify the prevalence of depression and susceptibility to eating disorders among female students in Malaysia. The second objective was to study the relationship among body image, depression and susceptibility to developing an eating disorder among female students. The third objective is to identify whether depression is a mediator between body image and susceptibility to eating disorders among female students in Malaysia.

To tie in with the objectives of the study, the first hypothesis was that there would be a significant positive relationship between depression and susceptibility to eating disorders among female students. The second hypothesis was that there exists a significant negative relationship between body image and depression and susceptibility to developing an eating disorder. The third hypothesis predicted that body image is the significant predictor of depression and susceptibility to eating disorders among female students. The fourth hypothesis stated that body image and depression significantly predicts susceptibility to eating disorders. The final hypothesis states that depression is a significant mediator between body image and susceptibility to eating disorders.

## MATERIALS AND METHODS

### Participants

Convenient sampling method was used to collect data from 206 undergraduate female students from one of the private university in Malaysia. Participants age ranged from 18 to 22 ( $m=19.5$ ;  $SD=2.63$ ).

### Materials

**Body Image Acceptance and Action (BI- AAQ):** The BI- AAQ was used to measure the body image acceptance [25]. It consists of 29 items and it is measured on seven point likert scale that ranges from 1="Never True" to 7="Always True". The instrument is scored by summing the items to make a total score. Higher scores indicate more acceptances towards body image and lower score indicate less body acceptance. The tool has a good internal consistency ( $\alpha=.77$ ) for current study.

**Eating Attitude Test- 26 (EAT-26):** The EAT- 26 was used to measure the vulnerability of eating disorder [26]. The instrument consists of 26 items and it is measured, in 4 likert scale ranges from 0="never" to 3 ="always". The instrument does not provide diagnostic and more to as a screening tool to recognize early appearances of behaviours indicating the impending presence of an eating disorder. Scoring for item 26 is in the reverse manner and the overall score ranges from 0 to 78. Participants with the score of 20 and above are considered as susceptible for eating disorder, whereas scores below 20 indicate not vulnerable for eating disorder. The scale had been widely used by various researchers, very well validated and has good internal consistency ( $\alpha = 0.87$ ) for current study.

**Patient Health Questionnaire- 9 (PHQ- 9):** The PHQ- 9 was used to measure depression [27]. It consists of 9 items and measured in 4 Likert scale ranges from 0="not at all" to 3="nearly every day".

The instrument is a screening tool for depression and does not provide any diagnostic features. The instrument was used to screen depressed related behaviours to flag the probability of occurrence of depression. It has cut-off scores as follows: "No depression"= 0-4, "Mild depression"= 5-9, "Moderate depression"= 10-14, "Moderately severe depression"= 15-19, "Severe depression" 20-27. However in the current study, "minimal depression" is considered as not depressed or depression otherwise specified. Whereas, "mild depression" and beyond counted as depressed. The tool is highly correlated with established depression inventory and has good internal consistency ( $\alpha = 0.79$ ) for current study.

### Procedure

Upon receiving the ethical and research committee approval from International Medical University, the researcher approached female students pursuing their undergraduate in International Medical University (IMU). Participants were explained about the aims of current study and were also informed that all information collected from them would remain strictly confidential. Once the written consent obtained, the BI- AAQ, PHQ- 9 and EAT- 26 were distributed to the participants. The author clarified the participants' doubts during filling of questionnaires. Participants were thanked for participating in this study.

## DATA ANALYSIS

Descriptive statistics were used to identify prevalence of depression and susceptibility of eating disorders among female students. Pearson's correlation were used to determine the relationship between continuous variables, depression and susceptibility of eating disorder, depression and body image acceptance and eating disorder. Regression analysis was used to predict the criterion variable (eating disorder) by using body image and depression as the predictors. In addition, regression has been used to find out whether depression is a mediating variable between body image and eating disorder.

## RESULTS

As seen in [Table/Fig-1], the prevalence of depression among the female student sample was 65.5%. [Table/Fig-2] shows the prevalence of susceptibility to eating disorder was 6.3% among female college students. [Table/Fig-3] displays the significant differences in the body image scores between those susceptible and not susceptible to eating disorders. Furthermore, the results showed that the mean value for body image was higher for students who were susceptible to eating disorders. A significant positive relationship was found between depression and susceptibility to eating disorders,  $r = 0.410$ ,  $p < 0.01$ , and a negative relationship was found between body image and depression,  $r = -.249$ ,  $p = 0.004$  and body image and eating disorder,  $r = -.325$ ,  $p < 0.01$  [Table/Fig-4]. The regression model of predictor variable (body image) and criterion variable (eating disorder) can be seen in [Table/Fig-5]. Eating disorder was predicted by body image,  $\beta = .32$ ,  $t = 3.97$ ,  $p < 0.01$ . The second regression model [Table/Fig-6] shows that depression was a predictor variable and eating disorder was a criterion variable. Depression had a unique effect on eating disorder,  $\beta = .24$ ,  $t = 2.96$ ,  $p = 0.004$ .

Depression levels	No (%)
Depression	135(65.5)
Non depression	71(34.5)
Total	206

[Table/Fig-1]: Prevalence of depression and susceptibility of eating disorder among female students.

Susceptible of Eating disorder	No (%)
Susceptible of Eating disorder	13(6.3)
Not Susceptible of Eating disorder	193(93.7)
Total	206

[Table/Fig-2]: Prevalence of susceptibility of eating disorder among female students.

	Susceptible of eating Disorder		Not Susceptible of Eating disorder		t(df)	p-value
	Mean	SD	Mean	SD		
Body image	130.46	18.26	98.34	36.42	5.63(204)	.000

**[Table/Fig-3]:** Difference between two groups of eating disorder on body image. M-mean; SD- standard deviation; df-degree of freedom.

Variables	1	2	3
Depression	1	.410*	-.249**
Susceptibility of eating disorder		1	-.325*
Body image acceptance			1

**[Table/Fig-4]:** Relationship between depression, susceptibility of eating disorder and body image. \* $p < 0.01$  \*\* $p = .004$

	B	SE	$\beta$
Eating disorder	0.473	2.118	
Body image	.076	0.19	.325*

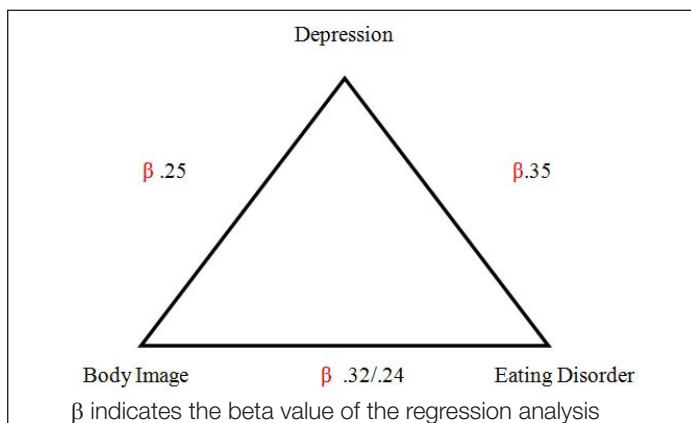
**[Table/Fig-5]:** Body image predicts susceptibility to eating disorder. \* $p < 0.01$ ; SE- standard Error;  $\beta$ - beta

	B	SE	$\beta$
Depression	6.481	1.131	
Body image	0.031	0.010	.249*

**[Table/Fig-6]:** Depression predicts the eating disorder.\* $p = .004$ ; SE-standard Error;  $\beta$ - beta

	B	SE	$\beta$	T	Sig.
Eating disorder	3.885	2.216		-1.753	
Body image	.056	.019	.238	3.003	.003*
Depression	.672	.152	.351	4.420	.000

**[Table/Fig-7]:** Eating disorder predicted by body image and depression SE-standard Error;  $\beta$ - beta; \*(statistically significant)



**[Table/Fig-8]:** shows, the regression analysis of the independent (body image) mediating (depression) and dependent variable (susceptible for eating disorder).

In [Table/Fig-7], the results of the regression analysis are reported, showing that body image ( $\beta = .238$ ,  $t = 3.003$ ;  $p = .003$ ), and depression predicted eating disorders,  $\beta = .351$ ,  $t = 4.420$ ,  $p = .000$ . Further analysis found that 22%, ( $r^2 = .22$ ,  $F(2, 132) = 18.748$ ,  $p < 0.01$ ) of eating disorders were predicted by body image and depression.

[Table/Fig-8] shows, the regression analysis of the independent variable (body image) mediating variable (depression) and dependent variable (susceptibility to eating disorders). After controlling for depression, the effect of body image appears to shrink, as the beta value was 0.32 without depression and 0.24 with depression. It indicated that depression partially mediated eating disorders. To determine whether there was a statistically significant partial mediation, a Sobel test was used. Sobel test  $p$ -value is  $< 0.05$  indicated the indirect effect of body image on eating disorder through depression. In other words, we can conclude that depression is a statistically significant partial mediator of the effect of body image on eating disorders.

## DISCUSSION

The current study aims to determine the relationship between depression, susceptibility to eating disorders and body image acceptance among female college students in one of the private universities in Malaysia. In this present study, the prevalence of depression among female students was 135(65.5%), and 13 students were susceptible to eating disorders (6.3%). Saravanan and Wilks found that 34.9% of students experience depression, and psychological stress is one of the significant predictors of depression among the student population [28]. Body image dissatisfaction may be one of the stresses that lead to negative emotional states such as depression [29]. Students who study in private universities experience more stress due to pressure to secure higher marks compared with students in public universities. This study was conducted in a private university. This could be the reason for the higher level of depression.

A total of 13 (6.3%) students in this present study were susceptible to eating disorders, which is comparatively low compared with previous studies which found that 18.2% of college students had eating disorders [9] and found 21% of people in Malaysia suffering from binge eating disorder [30]. Previous studies found that there is a strong correlation between body image and eating disorders [5,8]. The present study found the mean value of body image was higher among students who were susceptible to eating disorders. This indicates that dissatisfaction towards body image most likely leads to eating disorders among students.

The results of this study showed a significant positive correlation between depression and susceptibility to eating disorders. The results of this study were consistent with previous studies conducted in India that adolescents who were susceptible to depression were found to be more susceptible to developing eating pathology [18]. Similar outcomes were also found among the general population in Malaysia [9]. However, the present study findings were based on female college students in Malaysia. Furthermore, results were consistent with previous studies that concluded depression had significantly predicted negative perception of body image [31] and that females who are at risk for depression tend to have greater concerns about their body image [22].

Body image acceptance and susceptibility to eating disorders were found to be significantly negatively related, and dissatisfaction towards body image could contribute to the development of eating disorders in this study. For instance, a study conducted recently showed that eating disorder patients had significantly higher levels of body dissatisfaction compared to the control group of the study [32]. The results of a study of a female eating disorder group also revealed similar findings where negative body image cognition was more strongly correlated to eating disorders and having stronger negative reactivity compared to the group with no eating disorders [33].

In regard to gender, body image perception or body dissatisfaction varies based on the age of the women. For example, a study among older women suggests that older adults were having more positive, healthy perceptions of their body image and are less vulnerable to eating related disorders due to their life experience, maturity and reduced exposure to unrealistic models of beauty [34]. Therefore, girls and young women are more susceptible to body image dissatisfaction. Providing an insight and awareness program about body image will prevent depression and eating disorders. Even though the current study's outcome opposed most findings from past research, this should be explored further as there is a possibility that the sample population is undergoing some unique experience and that this had increased the level of body image acceptance among them.

The results of this study show that eating disorder was predicted by body image dissatisfaction and that depression was a partial mediator between body image and eating disorders. In other words, students who had dissatisfaction towards their body image perceived their bodily appearance was not good, and these students became disappointed in their body image and susceptible to eating disorders.



This result was consistent with previous findings that body image acceptance is a significant predictor for eating related pathology [35] and also with a study which showed that body dissatisfaction was successfully predicted by depression [31]. Though, depression was a partial mediator between body image and eating disorder, other factors served as a mediator between these two variables. For example, personality, peer pressure and culture are also mediators between body image and eating disorders [36].

## CONCLUSION

The results of this study contribute the development of the new theory that depression is a mediator between body image and eating disorders among college female students in Malaysia. Further, treating body image dissatisfaction and depressed mood may reduce the probability of eating disorders. Educational institutions have to provide knowledge about body image and the insight to recognize depression symptoms. Some students experience non-clinical depression or dysthymia due to body image dissatisfaction, and these students may not able to recognize their depressive symptoms, causing them to be vulnerable to eating disorders. Therefore, body image, depression and eating disorders are highly correlated. Having positive body image may help prevent the development of depression and eating disorders among the student population.

## ACKNOWLEDGEMENT

The authors are very grateful to all participants who participated in this study. This research project was financially supported by the International Medical University in Malaysia.

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Date of Submission: **Sep 07, 2015**  
Date of Peer Review: **Sep 25, 2015**  
Date of Acceptance: **Dec 09, 2015**  
Date of Publishing: **Mar 01, 2016**

FINANCIAL OR OTHER COMPETING INTERESTS: As declared above.