

## **Correlates of Disordered Eating Behavior among Pregnant Women**

**Rida Sohail and Amina Muazzam**

Lahore College for Women University

There is large number of research evidence on the existence of disordered eating behavior during pregnancy. However, in Pakistan no such study has been conducted so far that could address this issue. An initiative has been taken in the present study in this regard. For this purpose, a sample of 300 pregnant women (100 from each trimester of pregnancy) of age range 20-40 years was selected through nonprobability purposive sampling. A self-constructed structured interview schedule was used to probe demographic information (such as age, education, monthly income, and profession as well as information related to pregnancy such as month/trimester of pregnancy, height, weight, nausea experienced during pregnancy, and use of dietary supplements during pregnancy). In order to assess disordered eating behavior in pregnant women, the Disordered Eating Behavior Scale developed by Muazzam and Khalid (2011) was used. The focus of the present study was to find out the existence of disordered eating behavior in this sample of pregnant women as well as to know how factors like age, income, profession, education, trimester of pregnancy, nausea, and body mass index influence disordered eating in pregnancy. The research findings revealed the existence of disordered eating behavior in pregnant women as well as the factors mentioned earlier influenced disordered eating in pregnancy. Furthermore, participants' characteristics and pregnancy related factors predicted disordered eating behavior in pregnant women.

*Keywords:* disordered eating behavior, pregnancy, structured interview schedule, Disordered Eating Behavior Scale (DEBS)

Proper nutrition during pregnancy is considered important for the health of both mother and fetus. A balanced diet is necessary during

---

Rida Sohail and Amina Muazzam, Department of Applied Psychology, Lahore College for Women University, Lahore, Pakistan.

Correspondence concerning this article should be addressed to Rida Sohail, Department of Applied Psychology, Lahore College for Women University, Lahore. E-mail: ridasohail\_22@hotmail.com

pregnancy, delivery, and breastfeeding. The amount and quality of food taken during pregnancy affects the health of the unborn baby and also affects later health outcomes in the offspring. Maternal weight during pregnancy has a profound effect on both the mother as well as her child throughout the entire reproductive cycle. However, a great deal of change occurs in the eating patterns during pregnancy. Some women develop cravings for certain kind of food; some may avoid certain food; some eat more and others may eat less food. Many factors are known to influence these disturbances such as age, education, profession, and income level (Mitchell & Bulik, 2006). Numerous studies have been conducted in western countries that have identified the phenomena of disordered eating during pregnancy (Button, Loan, Davies, & Sonuga-Barke, 1997). Lai, Tang, and Tse (2006) have noted that pregnancy either elicits or aggravates disordered eating. They have found that pregnant women with a past history of an eating disorder may experience an increase in disordered eating symptoms during the postnatal period.

In several cases, the period of carrying a fetus may give rise to disordered eating behavior (Van den Broucke & Vandereycken, 1988). Furthermore, changes in shape of the body as well as cravings related to specific food create problems for women to control their weight and consumption of food (Van den Broucke, Vandereycken, & Norré, 1997). Research shows that many complications such as miscarriage can occur if a woman continues to engage in disordered eating behavior in pregnancy (Morgan, Lacey, & Sedgwick, 1999).

Women with disordered eating may not gain enough weight necessary for healthy pregnancy. As a result, such women are more likely to give birth to premature babies with multiple health problems. Continuous purging during pregnancy may create chemical irregularities and cardiac problems (National Eating Disorders Association, 2005). Adequate eating habits minimize the chances of poor health during that period. Healthy eating tends to show better gain of a mother's weight and is related to healthy birth results (Abrams, Altman, & Pickett, 2000).

During pregnancy, many women start taking dietary supplements. Many socio-demographic and lifestyle factors have been linked to the use of dietary supplements. It has been noted that well educated women are more likely to take dietary supplements despite the fact that their diet is already close to the nutritional recommendations without supplement use (Ervin, Wright, & Kennedy, 1999; Kaartinen, Ovaskainen, & Pietinen, 1997; Kirk, Cade, Barrett, & Conner, 1999; Paturi, Tapanainen, Reinivuo, & Pietinen, 2008; Yu, Kogan, & Huang, 2003). Age is another factor to be associated with higher

supplement use. However, not much data are available to indicate strong association between socio-demographic factors and supplement use during pregnancy. Furthermore, age and education did not separate supplement users and non-users during pregnancy (Erkkola, Karppinen, Jarvinen, Knip, & Virtanen, 1998). In British women, a strong association has been found between greater age and supplement use during pregnancy. It was also noted that pregnant women who are on a balanced diet and take dietary supplements during pregnancy are healthier and are less likely to engage in disordered eating behaviors (Mathews, Yudkin, Smith, & Neil, 2000).

Many studies have noted that women with low income have more disturbed eating patterns. Berkowitz and Papiernik (1993) identified that financial instability creates hindrance in the development of healthy eating patterns during pregnancy, as a result, in such a situation women are at high risk of giving birth to low birth weight infant. Morgan et al. (1999) found that pregnancy increases woman's concern regarding shape and weight of the body. Moreover, physiological changes that occur in pregnant women can create taste and smell variations which can further influence eating behavior (Fairburn, Stein, & Jones, 1992).

Over the past few years an increase has been observed in the incidence of disordered eating among working women as compared to nonworking women especially in professions like gymnastics and modeling as they demand women to be physically attractive which in turn lead women to engage in disordered eating behavior (Szmukler & Patton, 1995). When these working women become pregnant, they become more cautious about their weight and the way they look and as a result, they continue engaging in disordered eating behavior even in pregnancy (Ellison, 2000). Researchers have shown that women of all socioeconomic status and ethnicity are afflicted by eating disorders (Wertheim, Paxton, & Blaney, 2004). Factors, such as negative body image, fear of becoming fat, issues of feeling out of control, as well as pressures of society to be slim, have been found to be associated in triggering eating disorders during pregnancy or in general (Steiger, Gauvin, Jabalpurwala, Seguin, & Stotland, 1999).

Multiple changes occur in a woman during pregnancy. However, these changes may be different in each and every woman because each woman is unique and may experience changes in different ways. Hollifield and Hobdy (1990) have found that a woman experiences several issues during the course of pregnancy. These issues are associated with the three trimesters and are triggered by weight gain, changes in eating patterns during pregnancy. It is important for a medical practitioner to understand these changes and provide help to

the pregnant woman accordingly. The first trimester can be a challenge for a woman for several reasons. Hollifield and Hobdy (1990) found that women with an eating disorder often relate the changes in body and their increasing weight with obesity. Pregnant woman may experience anxiety that her weight gain will be attributed by others as getting fat or being out of control. During the first trimester, many women experience an increase in fatigue and may experience an increase in disordered eating symptoms (Franko, 2006).

Second trimester is a period during which pregnancy becomes real for the woman because she feels the first movement of the fetus. During this period, she imagines her new roles and responsibilities as a parent and also recounts the memories of her relationship with her parents. A woman with memories of parental rejection during childhood is more likely to approach motherhood with feelings of hopelessness and sadness (Crockenberg & Leerkes, 2003). Mitchell and Bulik (2006) suggested that parental rejection in childhood can contribute to increased anxiety during pregnancy and trigger disordered eating behaviors. However, second trimester is a period during which many women showed a decrease in disordered symptoms and become more careful towards their unborn child (Hollifield & Hobdy, 1990).

Pregnancy's third trimester is the most challenging period faced by a pregnant woman. The last month of pregnancy is accompanied by a substantial increase in appetite and weight gain. Body image issues become problematic during the last trimester. As a result, she perceives herself as being overweight and eventually prevents weight gain by minimizing food intake. It has been observed that many women in western countries often try to eat healthy foods but they binged and purged to prevent weight gain. Such disordered eating behaviors may be dangerous during pregnancy and may have serious consequences on mother and the fetus' health (Hollifield & Hobdy, 1990).

Many studies have shown that pregnant females having a background of eating disorder who suffers severe nausea and vomiting during pregnancy are less likely to gain weight, give birth to smaller babies, and have difficulty in breastfeeding (Stewart, 1992). Furthermore, severe nausea during pregnancy interferes with food consumption and does not allow women to eat and drink without vomiting thus leading them to certain eating problems (Broussard & Richter, 1998). The overall health of a pregnant woman largely depends on the eating patterns she adopts before, during, and after pregnancy.

Research has shown that elevated Body Mass Index (BMI) is positively associated with disordered eating behavior such as preoccupation with food. Furthermore, high BMI is linked with greater dissatisfaction with one's body which in turn is associated with a greater likelihood of disordered eating behavior (Mumford & Choudry, 2000). Unhealthy weight during pregnancy increases the risk of many health conditions including hypertension and diabetes and can lead to miscarriage or fetal death (Druxman, 2003).

Taking note of the multiple studies about eating disorder and pregnancy revealed that pregnancy triggers, worsen or reduces the symptoms of disordered eating. Some women with a past history of eating disorder may experience difficulty during pregnancy while others find pregnancy a pleasant experience. Pregnancy can be considered as a good time for intervention in order to reduce the suffering of the mother as well as to decrease the risk of harming the fetus and to minimize the generation-to-generation transmission of disordered eating behavior (Sanders, 2009).

In Pakistan, it has been observed that problems associated with women are not addressed with much attention. During pregnancy, many women experience severe stress which can either be physical and psychological in nature. A lot of changes occur in their eating patterns as well. There are very few women that follow the advice of a doctor strictly. The rest do not have enough awareness or do not have enough resources to pay special attention to their health (Society of Obstetricians and Gynecologists of Pakistan, 2009). This study points out the factors and predictors that contribute to disordered eating behavior during pregnancy. However, in Pakistan, data on the current issue is lacking and factors responsible for these disturbances are not yet identified. The present study is a contribution to fill this gap in the professional literature. It is very important to understand how disturbed eating patterns can affect the health of the fetus and the mother. In our culture, potential threatening factors for abnormal eating patterns must be identified so that education, treatment, and prevention could be assured. The main objective of the present research was to explore disordered eating behavior among pregnant women, as well as to see how different factors influence disordered eating in pregnancy such as profession, income, education, trimester of pregnancy, nausea experienced during pregnancy, and BMI during pregnancy.

### **Hypotheses**

- 1) Disordered eating behavior is high in the third trimester of pregnancy as compared to first and second trimester.

- 2) Working pregnant women have more disordered eating behavior than nonworking pregnant women.
- 3) Pregnant women with severe nausea have more disordered eating behavior.
- 4) Women with high BMI have more disordered eating behavior during pregnancy.

## Method

### Sample

In order to achieve the purpose of the study, 300 pregnant women (100 from each trimester of pregnancy) were taken. Nonprobability purposive sampling technique was used to collect the sample. Gynecological departments of different public and private hospitals and fertility centers from Lahore were identified for the selection of the sample. The present study included married pregnant women with intact marriages only (widows or divorced were not included in the sample). The age range of pregnant women was between 20-40 years of age. Those pregnant women were excluded who were not following in this age range, because according to Pakistan's Child Marriage Restraint Act of 1929, the minimum age for marriage of a girl is 16 years (Hameed, 2011) and medically after the age of 40 years the chances of conception become rare or nearly impossible (Southern California Centre for Reproductive Medicine, 2010). Both educated and uneducated pregnant women, were included. The current study included both working and nonworking pregnant women. Participants from every income group were targeted.

In Table 1, distribution of the demographic characteristics shows that the age of the sample ranged between 20 years to 40 years ( $M = 25.78$ ;  $SD = 2.55$ ) with further representing education (in years), monthly income, profession (working and nonworking pregnant women), weight, and level of nausea. Table indicates that highest percentage of the participants lie in 11-14 years of education. As far as profession is concerned 63.3% of the pregnant women were nonworking and remaining were working women. Among monthly total family income, highest percentage (41.33%) lies within 25000-50000. In weight range, highest percentage belongs to weight range 61-70 kg and lowest 71-90 kg. The results also indicate the extent to which pregnant women experienced nausea during pregnancy; 38.7% of women suffer severe nausea; 31.3% reported nausea to be

moderate; whereas, 15.7% and 14.3% reported mild and no nausea at all (see Table 1).

Table 1  
*Demographic Characteristics of Pregnant Women (N = 300)*

Variables	N	%
Age (20-40 years)		
20-25	137	45.67
26-40	163	54.33
Education (in years)		
0-10	89	29.67
11-14	129	43.00
15-18	82	27.33
Profession		
Housewife	190	63.3
Teacher	43	14.3
Variables		
Bank employee	8	2.7
Housemaid	18	6.0
Doctor	6	2.0
Misc	35	11.7
Family Income in Rupees (per month)		
10000-25000	74	24.67
26000-50000	124	41.33
51000-100000	102	34.00
Current weight (in kg)		
45-60	115	38.34
61-70	148	49.33
70-90	37	12.33
Nausea		
None	43	14.3
Mild	47	15.7
Moderate	94	31.3
Severe	116	38.7

### Measures

**Structured Interview Schedule.** It was a self-constructed structured interview based on the variables of the study to be explored. It was used to get the demographic information from the participants.

The questions that were asked in this interview were related to age (in years), marital status, income (in rupees), education, height (in meters), weight (in kg), number of pregnancies, number of children, month of pregnancy, nausea experienced during pregnancy, and use of dietary supplements.

The level of nausea was subjectively asked from the participants as severe (5 times and/or above in a day), moderate (3 to 4 times in a day), mild (1 to 2 times in a day), and no nausea at all. The categories and criteria of nausea were determined on the basis of information provided by the gynecologists. Furthermore, height and weight was asked to compute the BMI of the pregnant females. BMI was calculated through formula ( $BMI = \text{weight in kg} / \text{height in meters squared}$ ) and categorized as underweight or low ( $BMI < 18.5$ ), normal ( $BMI \geq 18.5$  and  $< 25$ ), overweight or high ( $BMI \geq 25$  and  $< 30$ ), and obese or very high ( $BMI \geq 30$ ) (Zamora, 2012). Furthermore, the BMI considered in the present study has taken into account the factor of pregnancy because women usually gain an approximate weight of 9-12 kgs during pregnancy (Baby Centre, 2012).

**Disordered Eating Behavior Scale (DEBS).** A self-report measure of 26 items developed by Muazzam and Khalid (2011) was used for the assessment of disordered eating behavior in pregnant women. Individual differences in patterns/behaviors of disordered eating are measured by this scale. In order to indicate the response, a five-point scale is used by the respondents in which 0 represents *never* and 4 represents *always*. The DEBS has an alpha coefficient of .86 (Muazzam & Khalid, 2011). The scale has four subscales i.e. (a) Social Pressure (6 items), (b) Eating Choices and Habits (5 items), (c) Eating Withdrawal (8 items), and (d) Overeating (7 items). The Cronbach's alpha for DEBS each subscale is .94, .95, .95, and .83, respectively. However, the analysis was conducted on aggregate of DEBS not the subscales of the same. The scale has indicated its discriminant validity ( $r = -.19$ ) with Rosenberg Self-esteem Scale (Rosenberg, 1965), and convergent validity ( $r = .64$ ) with Eating Attitude Test (Garner & Garfinkel, 1979). The Cronbach alpha reliability coefficient of the questionnaire on the current sample was .92.

## Procedure

Data collection was initiated after the approval of the study from the departmental research ethics committee of the parent institute. The 300 participants of the study were approached and were asked to

respond to a set of questionnaires consisting of structured interview schedule and DEBS. The structured interview schedule was the first one in the set of questionnaires to be administered, whereas, DEBS was the second. For the administration of the set of questionnaires the researcher visited each of the selected hospitals and fertility centers and obtained permission from the authorities of the gynecological department of each hospital from Lahore through the permission letter issued by the university. After taking informed consent from the participants, the set of questionnaire was given and the participants were explained the purpose of the study. The questionnaire administration was face to face. The participants were given information about how to fill the questionnaire and further queries of participants regarding the questionnaire were also resolved. They were requested to respond to the questionnaire honestly and properly. Finally, participants were assured that the data would be kept confidential and would solely be used for academic purpose.

## **Results**

In two phases the data for the present study was analyzed. In the first phase, independent sample *t*-test and one way ANOVA was used to find out differences among groups. Finally, in order to find out the predictors of disordered eating behavior for women in pregnancy, hierarchical multiple regression analysis was carried out.

### **Pregnancy Trimesters, Nausea, and BMI during Pregnancy**

In order to see the relationship of pregnancy's trimesters, nausea, and BMI during pregnancy with disordered eating behavior, one way analysis of variance was computed. Furthermore, Tuckey's post hoc test was carried out to see the mean difference across each category of trimester, nausea experienced during pregnancy, and BMI.

Variation in disordered eating behavior differed significantly across the three trimesters as indicated by Table 2. Disordered eating behavior is significantly higher in the third trimester than the first and the second trimester, respectively. Hence, the results support the hypothesis that disordered eating behavior varies in each trimester of pregnancy and that it is maximum in the third trimester of pregnancy (see Table 2).

**Table 2**  
*One way Analysis of Variance Showing Relationship of Pregnancy Trimesters, Nausea, and BMI during Pregnancy with Disordered Eating Behavior (N = 300)*

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	95% CI	<i>F</i>	$\eta^2$
Trimester <sup>a</sup>					126.86**	0.46
1 <sup>st</sup> Trimester	100	35.15	11.58	[32.85, 37.45]		
2 <sup>nd</sup> Trimester	100	17.99	5.40	[16.92, 19.06]		
3 <sup>rd</sup> Trimester	100	49.13	20.30	[45.10, 53.16]		
Nausea <sup>b</sup>					7.86**	0.07
None	43	30.26	18.15	[24.67, 35.84]		
Mild	47	26.20	17.46	[21.17, 31.43]		
Moderate	94	32.45	19.90	[28.37, 36.52]		
Severe	116	40.00	26.97	[36.88, 43.12]		
BMI <sup>c</sup>					3.35*	0.02
Normal	122	31.16	16.24	[28.25, 34.07]		
Overweight	118	34.82	20.78	[31.03, 38.61]		
Obese	60	38.60	18.80	[33.74, 43.46]		

Note. CI = Confidence Interval. <sup>a</sup>*df* = 2, 297; <sup>b</sup>*df* = 3, 296; <sup>c</sup>*df* = 2, 297.

\**p* < .05. \*\**p* < .01.

Results in Table 2 also indicate that the disordered eating behavior is significantly higher in pregnant women with severe nausea as compared to pregnant women with moderate, mild, and no nausea at all. Table 2 shows that pregnant women with elevated BMI score are significantly higher than the women who have normal BMI. In the present study, not a single pregnant woman is underweight because women usually gain approximately 9-12 kgs during pregnancy (Baby Centre, 2012). Hence, the results support the hypothesis that pregnant women with severe nausea and high BMI have more disordered eating behavior.

### **Disordered Eating Behavior among Working and Nonworking Pregnant Women**

Independent sample *t*-test was used to compare disordered eating behavior among working (*n* = 110) and nonworking (*n* = 190)

pregnant women. The results showed that working pregnant women exhibit more disordered eating behavior ( $M = 41.36$ ;  $SD = 18.98$ ) than nonworking pregnant women ( $M = 29.88$ ;  $SD = 17.39$ ). The differences are significant,  $t(298) = 5.329$ ,  $p < .01$ , 95% CI [7.244, 15.73]. Furthermore, Cohen's effect size value ( $d = 0.6$ ) indicate a large effect size.

### **Use of Dietary Supplements in Pregnancy**

The present study also tried to explore the use of dietary supplements during pregnancy and its association with demographic characteristics of the participants and disordered eating behavior. However, in the case of present study no such association has been observed because all the pregnant women in the current study reported the use of dietary supplements so, for that reason statistical analysis could not be carried out. Moreover, the present study sample engaged in disordered eating habits despite of the fact that they were using dietary supplements because it is recommended by the doctors/gynecologists to take dietary supplements during pregnancy for the better health of the mother and the fetus.

### **Predictors of Disordered Eating Behavior**

Hierarchical multiple regression analysis was employed in the present study to find out what factors predict disordered eating behavior in pregnant women. The available evidence suggest that multiple factors are involved in causing disordered eating behavior during pregnancy (Button, Loan, Davies, & Sonuga-Barke, 1997), so for that reason independent variables were identified to see their involvement in the development of disordered eating behavior during pregnancy. Hierarchical regression was used to see which factor predict the most than other in the model. The regression procedure was initiated in two steps. Participants' characteristics were entered in the first step: (1) age, (2) education, (3) total family income, and (4) profession – the variable of profession has two categories: working and nonworking women, here working was coded as 1 and nonworking was coded as 0 . Whereas, pregnancy related factors such as (1) BMI, (2) trimester of pregnancy, and (3) nausea experienced during pregnancy were entered in the second step. Participants' characteristics and pregnancy related variables were tested separately in separate models. The major aim was to find out which model accounted for the most variance in the disordered eating behavior.

Table 3  
*Hierarchical Multiple Regression Analysis Showing Predictors of Disordered Eating Behavior During Pregnancy*

Step & Predictor Variables	B	S.E.	$\beta$	$R^2$	$\Delta R^2$
Participants' Characteristics				.11	.11**
Age	-.85	.41	-.12*		
Education	.06	.25	.01		
Profession	10.28	2.19	.26**		
Total Family Income	.000	.000	.11**		
Pregnancy related Factors				.26	.26**
Trimester	10.50	1.27	.46**		
Nausea	7.86	.98	.44**		
BMI	3.40	1.28	.14**		

Note.  $\beta$  = standardized beta coefficient.

\* $p < .05$ . \*\* $p < .01$ .

Participants' characteristics accounted for 11% of variance in disordered eating behavior during pregnancy, as indicated by Table 3. Beta coefficients generated significant results for age ( $\beta = -.12$ ,  $p < .05$ ), profession ( $\beta = .26$ ,  $p < .01$ ), and total family income ( $\beta = .11$ ,  $p < .01$ ), which further shows that these variables are significant predictors of disordered eating behavior during pregnancy. However, education is not proved to be a significant predictor. Whereas, pregnancy related factors accounted for 26% of variance in disordered eating behavior. Results showed that trimester of pregnancy ( $\beta = .46$ ,  $p < .01$ ), nausea during pregnancy ( $\beta = .44$ ,  $p < .01$ ), and BMI ( $\beta = .14$ ,  $p < .01$ ) significantly predicted disordered eating behavior during pregnancy.

## Discussion

The findings of the present study revealed the existence of disordered eating behavior in Pakistani pregnant females. Mere observation of the collected data indicated that pregnant women engage in disordered eating behavior without knowing that they have disordered eating behavior. Multiple studies have been conducted in the western world regarding the prevalence and adverse effects of disordered eating during pregnancy (Abrams et al., 2000; Button et al., 1997; Vaillancourt, 2007). However, in Pakistan no data on disordered eating behavior during pregnancy is present to address this issue.

Existing research literature indicated that pregnancy is a crucial time for a woman to develop disordered eating because many women view pregnancy as a threat to their body weight and shape (Abraham & Llewellyn-Jones, 2001).

The present study has explored some of the factors that are possible contributors to disordered eating behavior in pregnant women. The important findings of the current research showed that disordered eating behavior varies with each trimester of pregnancy and that disordered eating behavior is high in the third trimester of pregnancy (Hollified & Hobdy, 1990). Furthermore, it was discovered that income level and profession have a pivotal role in the development of disordered eating behavior during pregnancy (Ellison, 2000; Frances & Berg, 2001; Kenny & Adams, 1998). In addition, severe nausea and high BMI have found to be associated with high disordered eating behavior during pregnancy (Broussard & Richter, 1998; Mumford & Choudry, 2000). However, there are many other factors that may also contribute to disordered eating behavior in pregnant women.

An important proposition in the current research was that disordered eating behavior varies with each trimester of pregnancy and that disordered eating behavior tends to be high in the third trimester of pregnancy. The findings of the current study supported the proposition and are consistent with the study presented by Hollified and Hobdy (1990), according to which pregnancy brings several problems for women and plays different roles in each trimester.

It was also hypothesized that working pregnant women exhibit more disordered eating behavior than nonworking women. The findings support the hypothesis. Research showed that profession like medicine, teaching, sports, and modeling demand women to be physically attractive and presentable as well as to have a hectic working schedule. Such heavy demands and pressures of society have become a reason for working women, whether pregnant or not, to engage in disordered eating behavior (Ellison, 2000).

The current study showed that pregnant women with severe nausea exhibited more disordered eating behavior as compared to women with moderate, mild, and no nausea at all. Broussard and Richter (1998) showed that severe nausea interfered with the consumption of a sufficient amount of fluid and nutrients. It did not allow pregnant women to eat and drink without vomiting. Around 70-90% percent of women reported disordered eating behavior due to severe nausea during pregnancy.

The analysis of the study data supported the hypothesis showing that pregnant women who were obese and overweight scored higher than pregnant women with normal BMI. In addition, the analysis of the study data indicated that not a single pregnant woman was underweight because women usually gain an approximate weight of 9-12 kg during pregnancy. Moreover, the factor of pregnancy was taken into consideration while calculating the BMI of pregnant women (Baby Centre, 2012). Hence, the results supported the hypothesis that pregnant women with high BMI have more disordered eating behavior. Mumford and Choudry (2000) had similar findings that women with elevated BMI were more likely to exhibit disordered eating behavior.

Hierarchical multiple regression analysis was employed to find out the contribution of age, profession, income, education, BMI, trimester of pregnancy, and nausea during pregnancy in predicting disordered eating behavior. The findings revealed that the above-mentioned factors were significant predictors of disordered eating behavior in pregnant women excluding education. Alison (2008) suggested that disordered eating behavior is age related and women belonging to the age range of 17-30 years are more likely to exhibit disordered eating behavior. Salmon, Crawford, Dane, and Zuberbier (2008) indicated that working women, whether pregnant or not, are at risk of developing disordered eating behavior because they find it hard to handle professional demands and pressures such as work load, stressful work environment, and severe competition.

Total family income of pregnant women also predicted disordered eating behavior during pregnancy. Evidence suggests that pregnant women belonging to high and low income groups are equally vulnerable to developing disordered eating behavior during pregnancy. The reason can be that pregnant women with low income are unable to engage in healthy eating practices due to lack of financial resources, whereas women with high income exhibit disordered eating behavior in order to become socially acceptable and to overcome societal pressures regarding the achievement of perfect body size (Frances & Berg, 2001). Education was not shown to be a significant predictor of disordered eating behavior because disordered eating behavior affects women of every age, income, and cultural group regardless of their education (Kenny & Adams, 1994).

Furthermore, pregnancy related factors such as trimester of pregnancy, nausea during pregnancy, and BMI were found to be significant predictors of disordered eating behavior during pregnancy. Hollified and Hobdy (1990) explained in their study that pregnancy is associated with several problems and are linked with the three

trimesters. Nausea was also found to be a significant predictor of disordered eating behavior during pregnancy. Broussard and Richter (1998) noted that severe nausea creates difficulty in the consumption of vital nutrients, and in order to avoid nausea, pregnant women engage in disordered eating behavior during pregnancy. Moreover, BMI was also found to be a significant predictor of disordered eating behavior during pregnancy. The available literature indicated that elevated BMI is one of the predictors of disordered eating behavior especially with respect to weight issues (Wertheim et al., 2004).

Moreover, the additional point for discussion is the use of dietary supplements during pregnancy. Research indicates that dietary supplements are more likely to be taken by well educated women (Ervin et al., 1999; Kaartinen et al., 1997; Kirk et al., 1999; Paturi et al., 2008; Yu et al., 2003). However, in the present study, this factor did not influence the intake of dietary supplements because the entire study sample reported the use of dietary supplements. This was because during pregnancy, the mother needed extra nutrients and minerals because another life was now attached to her. So doctors recommended mineral and vitamin supplements to every pregnant woman for the better health of the mother as well as the fetus. Furthermore, in the present study no clear association was found between the uses of dietary supplements and disordered eating behavior. Contrary to the research by Mathews et al. (2000) in which they have noted that pregnant women who take dietary supplements are less likely to engage in disordered eating behavior, the present study sample engaged in disordered eating habits despite of the fact that they were using dietary supplements.

Finally, it has been noted after talking to various gynecologists and health care practitioners that disordered eating behavior does exist in Pakistani pregnant women, but demographic and pregnancy-related factors were not the only ones causing it. Further studies should be conducted to explore factors like poverty, illiteracy, lack of information, poor hygiene, and absence of health care facilities that are forcing pregnant women to engage in unhealthy eating practices and thus leading to disordered eating behavior.

### **Limitations**

First, data were collected on the basis of convenience and only a few factors of disordered eating were explored. Secondly, the study sample was selected through purposive sampling which makes it hard to generalize the results to every pregnant woman. The present

research sampled pregnant women of some areas of Lahore and was unable to sample pregnant women from other regions of the city.

Third, it was difficult to collect the data because pregnant women were quite hesitant in filling out the questionnaire. One of the reasons observed by the researcher was that some of the pregnant women were caring for other children, which they had brought with them, while some of them were suffering from pregnancy complications e.g. nausea. A little more cooperation from the gynecologists would help the researcher to obtain a great deal of information about the health issues of the pregnant women. Lack of cooperation by the hospital authorities and the gynecologists was proved to be another obstacle in data collection. They were reluctant to allow the researcher to enter the gynecological ward and consult the respective doctor. Only questions were allowed from the patients in the waiting area, which was not sufficient.

Finally, data analysis along subscales of Disordered Eating Behavior Scale was not conducted as the prime focus of research was to identify the correlates of disordered eating in pregnant women.

### **Recommendations**

Cluster sampling technique should be used so that the generalization of the findings becomes easier. Pakistan is a diverse land and has diverse cultures and people. Pregnant women living in other areas have different health problems and concerns. So, further studies are needed that include pregnant women belonging to every region of Pakistan in order to have better understanding of their health issues and the phenomenon of disordered eating in pregnant women.

The present research explored the role of age, profession, education, trimester of pregnancy, BMI, and effect of nausea in the development of disordered eating behavior during pregnancy. However, other factors such as family system (Bruch, 1985), stressful life events (Ball & Lee, 2000), and self-esteem (Smith, 2012) that are not identified in this research project can play a role in triggering disordered eating behavior during pregnancy. Further studies should be conducted that would explore these factors with respect to disordered eating behavior during pregnancy.

Different tools should be used along DEBS in order to have a better understanding of the factors for disordered eating behavior during pregnancy. Awareness regarding disordered eating behavior should be provided to pregnant women by medical practitioners who can guide them in their eating habits. Furthermore, this study should

be conducted as a part of “National Health Survey” so that other contributing factors of disordered eating could be identified and addressed.

### Conclusion

The findings indicated presence of disordered eating behavior in pregnant women of Pakistan. Furthermore, presence or extent of disordered eating behavior were affected considerably by the factors of age, income, and profession of the pregnant women. In addition, disordered eating behavior was also predicted by the factors associated with pregnancy, such as trimester of pregnancy, nausea experienced during pregnancy, and BMI during pregnancy.

### References

- Abraham, S., & Llewellyn-Jones, D. (2001). *Eating disorders: The facts* (5<sup>th</sup> ed.). New York: Oxford University Press, Inc.
- Abrams, B., Altman, D., & Pickett, K. (2000). Pregnancy weight gain: Still controversial. *American Journal of Clinical Nutrition*, 71, 1233-1241. Retrieved from <http://rd.springer.com/article/10.1007/s10995-007-0273-5>
- Alison, F. (2008). Family, peer, and media predictors of becoming eating disordered. *Archives of Pediatrics & Adolescent Medicine*, 162(6), 574-579. doi:10.1001/archpedi.162.6.574
- Baby Center. (2012). *Weight gain in pregnancy*. Retrieved from <http://www.babycentre.co.uk/pregnancy/antenatalhealth/physicalhealth/weightgain/>
- Ball, K., & Lee, C. (2000). Relationships between psychological stress, coping and disordered eating: A Review. *Psychology & Health*, 14(6). doi: 10.1080/08870440008407364
- Berkowitz, G., & Papiernik, E. (1993). Epidemiology of preterm birth. *Epidemiologic Reviews*, 15, 414-443. Retrieved from <http://pubmedcentralcanadaca/redirect3.cgi?&&reftype=pubmed&article-id=1383575&issue-id=49207&journal-id=772&FROM=Article%7CCitationRef&TO=Entrez%7CPubMed%7CRecord&renderingtype=normal&&http://pubmedcentralcanada.ca/pubmed/8174665>
- Broussard, C. N., & Richter, J. E. (1998). Nausea and vomiting of pregnancy. *Gastroenterol Clinics of North America*, 27(1), 123-151. Retrieved from [http://www.gastro.theclinics.com/article/S0889-8553\(05\)70350-2/abstract](http://www.gastro.theclinics.com/article/S0889-8553(05)70350-2/abstract)
- Bruch, H. (1985). Four decades of eating disorders. In D. Garner, & P. Garfinkel (Eds.), *Handbook of psychotherapy for anorexia nervosa and bulimia* (pp. 7-18). New York: Guilford Press.

- Button, E. J., Loan, P., Davies, J., & Sonuga-Barke, E. J. (1997). Self-esteem, eating problems, and psychological wellbeing in a cohort of schoolgirls aged 15-16: A questionnaire and interview study. *International Journal of Eating Disorders*, *21*, 39-47. doi: 10.1002/(SICI)1098-108X(199701)2:1<39::AID-EAT5>3.0.CO;2-4
- Crockenburg, S., & Leerkes, E. (2003). Parental acceptance, postpartum depression, and maternal sensitivity: Mediating and moderating the process. *Journal of Family Psychology*, *17*, 80-90. doi: 10.1037/0893-3200.14.2.237
- Croxman, L. (2003). *The body image we see and feel*. Retrieved from <http://www.ideafit.com/fitness-library/body-image-the-body-image-we-see-and-feel-the-body-image-we-see-and-feel-w>
- Ellison, M. (2000). *Anorexia and professional women*. Retrieved from <http://www.suite101.com/article.cfm/anorexia/44340>
- Ervin, R. B., Wright, J. D., & Kennedy, J. (1999). Use of dietary supplements in the United States, 1988-94. *Vital Health Statistics*, *11*, 1-14. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10464471>
- Erkkola, M., Karppinen, M., Jarvinen, A., Knip, M., & Virtanen, S. M. (1998). Vitamin D and iron intakes are low among pregnant Finnish women. *European Journal of Clinical Nutrition* *52*, 742-748. Retrieved from <http://www.nature.com/ejcn/journal/v52/n10/abs/1600638a.html>
- Fairburn, C. G., Stein, A., & Jones, R. (1992). Eating habits and eating disorders during pregnancy. *Psychosomatic Medicine*, *54*, 665-672. Retrieved from <http://www.psychosomaticmedicine.org/content/54/6/665.abstract>
- Frances, M., & Berg, M. S. (2001). Income level and BMI as predictors of disordered eating. *Healthy Weight Journal*, *15*(1), 4-16. Retrieved from <http://www.healthyweight.net>
- Franko, D. L. (2006). Eating disorders in pregnancy and the postpartum: Empirically informed treatment guidelines. In V. Hendrick (Ed.), *Current clinical practice: Psychiatric disorders in pregnancy and the postpartum: Principles and treatment* (pp. 179-196). New Jersey: Humana Press.
- Garner, D. M., & Garfinkel, P. E. (1979). The eating attitude test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, *273-279*. doi: 10.1017/s0033291700030762
- Hameed, A. (2011). *Laws of Pakistan concerning Muslim marriages: The Child Marriage Restraint Act of 1929*. Retrieved from <http://www.raahnuma.org/posts/marriage-in-pakistan/>
- Hollifield, J., & Hobdy, J. (1990). The course of pregnancy complicated by bulimia. *Psychotherapy*, *27*(2), 249-255. doi: 10.1037/0033-3204.27.2.249
- Kaartinen, P., Ovaskainen, M. L., & Pietinen, P. (1997). The use of dietary supplements among Finnish adults. *Scandinavian Journal of Nutrition*, *41*, 13-17. Retrieved from <http://agris.fao.org/agris-search/search/display.do?f=1997/SE/SE97006.xml;SE9711791>

- Kenny, D., & Adams, R. (1994). The relationship between eating behaviors, Body Mass Index, age, gender, and education in Australian women. *Australian Psychologist, 29*, 128-134. doi: 10.1080/00050069408257336
- Kirk, S. F., Cade, J. E., Barrett, J. H., & Conner, M. (1999). Diet and lifestyle characteristics associated with dietary supplement use in women. *Public Health Nutrition, 2*, 69-73. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10452734>
- Lai, B., Tang, C., & Tse, W. (2006). A longitudinal study investigating disordered eating during the transition to motherhood among Chinese Women in Hong Kong. *International Journal of Eating Disorders, 39*(4), 303-311. doi: 10.1002/eat.20266
- Mathews, F., Yudkin, P., Smith, R. F., & Neil, A. (2000). Nutrient intake during pregnancy: The influence of smoking status and age. *Journal of Epidemiology & Community Health, 5*, 17-23. doi:10.1136/jech.54.1.17
- Mitchell, A. M., & Bulik, C. M. (2006). Eating disorders and women's health: An update. *Journal of Midwifery and Women's Health, 51*, 193-201. doi: 10.1016/j.jmwh.2006.01.005
- Morgan, J. F., Lacey, J. H., & Sedgwick, P. M. (1999). Impact of pregnancy on bulimia nervosa. *British Journal of Psychiatry, 174*, 135-140. doi:10.1192/bjp.174.2.135
- Muazzam, A. B., & Khalid, R. (2011). Development and validation of Disordered Eating Behavior Scale: Identification, prevalence and difference with clinically diagnosed eating disorders. *Pakistan Journal of Psychological Research, 26*(2), 127-148.
- Mumford, D. B., & Choudry, I. Y. (2000). Body dissatisfaction and eating attitudes in slimming and fitness gyms in London and Lahore: A cross-cultural study. *European Eating Disorders Review, 8*, 217-224. doi: 10.1002/(sici)1099-0968(200005)8:3<217::aid-erv322>3.0.co;2-q
- National Eating Disorders Association. (2005). *Eating disorders & pregnancy: Some facts about the risks*. Retrieved from <http://www.nationaleatingdisorders.org/nedaDir/files/documents/handouts/Pregnant.pdf>
- Paturi, M., Tapanainen, H., Reinivuo, H., & Pietinen, P. (2008). *The National Diet Survey*. Publications of the National Public Health Institute. Helsinki University Press.
- Rosenberg, M. (1965). *Society and the adolescent of self-image*. New Jersey: Princeton University Press.
- Salmon, C., Crawford, C., Dane, L., & Zuberbier, O. (2008). Ancestral mechanisms in modern environments: Impact of competition and stressors on body image and dieting behavior. *Human Nature, 19*, 103-117. doi: 10.1007/s12110-008-9030-8
- Sanders, C. (2009). *Eating disorders and pregnancy*. Retrieved from [http://www.vanderbilt.edu/ans/psychology/health\\_psychology/sanders.htm](http://www.vanderbilt.edu/ans/psychology/health_psychology/sanders.htm)
- Smith, M. (2012). *What are eating disorders: Relationship between self-esteem and eating disorders*. Retrieved from <http://mindofthematter.com/>

- 2012/10/30/what-are-eating-disorders-relationship-between-self-esteem-and-eating-disorders/
- Society of Obstetricians and Gynecologists of Pakistan. (2009). *Health of women in Pakistan*. Retrieved from <http://www.wfpak.org/pdfs/GBV-RH/ResearchReports/Health%20of%20Women%20in%20Pakistan%20SOGP%20Annual%20Report%202009.pdf>
- Southern California Centre for Reproductive Medicine. (2010). *A woman's age and fertility*. Retrieved from <http://www.socalfertility.com/age-and-fertility.html>
- Steiger, H., Gauvin, L., Jabalpurwala, S., Seguin, J. R., & Stotland, S. (1999). Hypersensitivity to social interactions in bulimic syndromes: Relationship to binge eating. *Journal of Consulting and Clinical Psychology, 67*(5), 765-775. doi: 10.1037/0022-006X.67.5.765
- Stewart, D. E. (1992). Reproductive functions in eating disorders. *Annals of Medicine, 24*, 287- 291. Retrieved from <http://www.iaac.ca/content/eating-disorders-fertility-and-pregnancy-donna-stewart-md-frcp-csummer>
- Szmukler, G. I., & Paton, G. (1995). Sociocultural models of eating disorders. In G. I. Szmukler, C. Dare, & J. Treasure (Eds.), *Handbook of eating disorders: Theory, treatment, and research* (pp. 177-192). New York: John Wiley & Sons.
- Vaillancourt, C. (2007). *Disordered eating and pregnancy*. Retrieved from <http://dtp.lib.athabasca.ca/action/download.php?filename=caap-loi/ChantLOIFinalapproved.pdf>
- Van den Broucke, S., & Vandereycken, W. (1988). Anorexia nervosa and bulimia in married patients: A review. *Comprehensive Psychiatry, 29*, 165-173. doi: 10.1016/0010-440X(88)90010-7
- Van den Broucke, S., Vandereycken, W., & Norré, J. (1997). *Eating disorders and marital relationships*. New York: Routledge.
- Wertheim, E. H., Paxton, S. J., & Blaney, S. (2004). Risk factors for the development of body image disturbances. In J. K. Thompson (Ed.), *Handbook of eating disorders and obesity* (pp. 112-129). New Jersey: John Wiley & Sons, Inc.
- Yu, S. M., Kogan, M. D., & Huang, Z. J. (2003). Vitamin-mineral supplement use among US women, 2000. *Journal of the American Medical Women's Association, 58*, 157-164. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12948107>
- Zamora, A. (2012). *Body mass index (BMI)*. Retrieved from <http://www.scientificpsychic.com/health/Body-Mass-Index-BMI.html>

Received December 02, 2011

Revision received November 20, 2012