

**Correlational Study Between Disordered Eating and Postpartum Depression Among
Women Four-to-Eight Weeks Postpartum**

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Abstract

Postpartum depression and disordered eating among mothers entail feelings of maternal inadequacy, a lack of self compassion, and thoughts of suicide and/or infanticide (Center for Disease Control, 2020; Palladino, 2011). Despite this, there are no studies that assess if there is a correlation between the two at the four-to-eight week period, a time they commonly develop. Knowing if there is a correlation between them during this could inform practice standards for timing of assessment. The purpose of this non-experimental correlational study was to determine if there is a correlation between disordered eating and postpartum depression at four-to-eight weeks postpartum. The population included women that are 18 years or older, have delivered their baby four to eight weeks prior to filling out the survey, are able to speak and read in English, have no alterations in their mental status, and are willing to participate. Participants were recruited through posters set up in a Middle Tennessee OB-GYN clinic that contained a link to an online survey where they filled out demographic information, the Eating Disorders Examination Questionnaire (EDE-Q) to measure disordered eating, and the Edinburgh Depression Pregnancy Scale to measure postpartum depression. A significant positive correlation was found between EDE-Q and EPDS total scores, suggesting at four-to-eight weeks postpartum, symptoms of postpartum depression increase as symptoms of disordered eating increase. While this study's findings are limited by the small sample size, the designs of this experiment can be applied to larger populations and encourage better assessment and intervention of these disorders.

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Pregnancy is an exciting time as mother and fetus develop a bond that is experienced by no one else but the two. Pregnancy however comes with its demands as a woman's body goes through drastic shape changes and weight gain. Recommended guidelines suggest that women within a normal BMI gain 25-35 pounds by the end of the pregnancy (American College of Obstetrics and Gynecology [ACOG], 2020). Mothers find these changes as a necessary means to adequately house and nourish the fetus and can even be more accepting of their body in its pregnancy form. However, weight gain and body shape changes can be a distressing time after delivery when there is weight retention and the body does not revert to its original pre-pregnancy form (O’Loughlen & Galligan, 2021; Skouteris, 2012). One study conducted found that of women up to one year postpartum, 47% were 10 lbs. heavier and 24% were 20 lbs. heavier than before pregnancy (Endres et al., 2015). Lovering et al., (2018) found that this body dissatisfaction is highly attributed to sociocultural factors including the influence that media, family, peers, and partner support has on a woman’s postpartum body image.

Body dissatisfaction may heighten in the postpartum period, with some women developing disordered eating in response to these pregnancy-associated body changes (Bergmeier et al., 2020). Disordered eating is an umbrella term to describe problematic eating behaviors that do not necessarily make up the exact criteria of eating disorders that are defined by the American Psychiatric Association (APA, 2013) including Anorexia Nervosa, Bulimia

Nervosa, and Binge Eating. Such disordered eating behaviors are defined as but are not limited to

- frequent dieting, anxiety associated with specific foods or meal skipping
- chronic weight fluctuations
- rigid rituals and routines surrounding food and exercise
- feelings of guilt and shame associated with eating
- preoccupation with food, weight and body image that negatively impacts quality of life
- a feeling of loss of control around food, including compulsive eating habits
- using exercise, food restriction, fasting or purging to "make up for bad foods" consumed.

(Academy of Nutrition and Dietetics, 2018)

Disordered eating behaviors may fit under what is further defined as Other Specified Feeding or Eating Disorder or Eating Disorders Not Otherwise Specified (APA, 2013). While disordered eating behaviors are evident during pregnancy, rates are higher in the postpartum period, specifically during the first 0-6 weeks after delivery (Pettersson et al., 2016; Hawkins & Gottlieb, 2013). During this time, women with a past of disordered eating or eating disorders may relapse and those without such a history are likely to develop them` (Fogarty et al., 2018; Bergmeier et al., 2020).

ACOG (2019) identifies that postpartum depression most commonly develops 0-3 weeks after birth, affecting around one in eight women. They underline numerous symptoms of postpartum depression including crying more often, feeling angry, isolating from loved ones, feeling a lack of connection with the baby, worrying that one will hurt the baby, and finally feeling like a bad mother (Center for Disease Control and Prevention, 2020). Moreover, the

mother may become suicidal or have thoughts of suicide and/or infanticide; in fact, more mothers die from suicide than hemorrhages or hypertensive disorders (Palladino, 2011).

Postpartum depression also affects the mother's care for the child. Mothers affected by postpartum depression tend to follow safety protocols less (including home safety devices and ensuring the infant lays on its back to sleep), attend fewer child wellness checks, and do not read or sing to the infant as often (Goodman, 2019). Children are affected as well. As a mother's lack of care and genes inherited from the mother coalesce, children of mothers with postpartum depression experience higher rates of anxiety, depression, disturbed sleep patterns, ADHD, and other behavior/conduct problems (Goodman, 2019). Clearly, postpartum depression carries serious implications for both the mother and child.

Review of Literature

Bauman et al., (2020) conducted a nonexperimental study to determine the prevalence of postpartum depression among women within two to six months of a live birth and the frequency of healthcare providers assessing for postpartum depression. The data was retrieved from the Pregnancy Risk Assessment Monitoring System (PRAMS) where a random, stratified sample of 32,659 of women from thirty-one states were obtained. Demographics they collected included their age group, race/ethnicity, years of education, marital status, WIC participation during pregnancy, health insurance at delivery, number of previous live births, smoked cigarettes during last 3 months of pregnancy, smoked cigarettes postpartum, any intimate partner violence before/during pregnancy, breastfeeding duration, infant gestational age at birth, infant alive or deceased at survey completion, and self-reported depression before and/or during pregnancy. To indicate whether a woman was suffering from postpartum depression, The Patient Health

Questionnaire-2 tool was utilized. Researchers did identify a limitation with self-reported postpartum depressive symptoms was not necessarily indicative of a clinical diagnosis of depression. They found that an average of 13% of women across all sites reported symptoms of postpartum depression. The highest percentage of those who experienced postpartum depression were 19 years old or under; were American Indian/Native American; smoked during or before pregnancy; experienced intimate partner violence before or during pregnancy; experienced self-reported depression before or during pregnancy, and/or whose infant was deceased. They reported that the overall 87% reported that their healthcare providers inquired about postpartum depression. Over 96% of the women in Vermont reported being assessed for depression compared to 51% of the women in Puerto Rico.

Petterson et al., (2016) aims to take a more standardized approach to assessing disordered eating in the pregnant population to address the limitations of previous research. Other studies have used non-standardized questionnaires and/or were unclear about what they considered an eating disorder. Peterson et al., assessed for suspected disordered eating in prenatal and postpartum women, utilizing an optimized version of the EDE-Q. The EDE-Q is originally a 28-item questionnaire with 22 items covering attitudes over restraint, eating concern, shape concern, and weight concern. The remaining six questions (13-18) are additional questions where participants must fill in how many times or days they have performed a specific disordered eating behavior (see Appendix A). These six questions are not considered as a part of any subcategory nor considered part of the global score as per the EDE-Q scoring directions. Subscores are calculated for each of these sections and a global score is calculated with a score over 2.8 being the cutoff for having disordered eating symptomatology. This was optimized for better use in the postpartum sample by removing 6 items that were not as relevant to measuring

disordered eating symptoms. A sample of 426 prenatal mothers and 345 postpartum mothers that were at their six-to-eight month mark were recruited at clinics in metropolitan Stockholm. They reported that the prevalence of suspected disordered eating during these two time periods were much higher than previous research had calculated with 5% of prepartum women and 13% of postpartum women scoring positively for suspected cases of eating disorders. Because disordered eating was distinctly higher among postpartum women, researchers concluded that perhaps mothers at risk of developing disordered eating improve their eating habits during pregnancy. However, these efforts deteriorate after delivery.

Fogarty et al., (2018) conducted a systematic review of qualitative studies observing the effects that eating disorders have on mothers throughout the perinatal period, which they defined as conception through two years after delivery. Bulimia Nervosa, Binge-Eating Disorder, PICA, Avoidant/Restrictive Food Intake Disorder, or other/unspecified eating disorder were the categories that fell under eating disorder consideration. A total of 94 women currently pregnant and postpartum were assessed among the studies. In their findings, many women who had an eating disorder prenatally had a positive change in their body image and eating habits when pregnant. However, these experiences were not sustained after birth. Many either returned to their old eating disorder habits or experienced much more extreme eating disorder habits as a means to lose the weight they had gained. Common themes among these women were feelings of loss of control or harsh feelings towards one's own body.

Bergeimer et al., (2020) formed a conceptual model of the relationship between body image, body dissatisfaction, and mother and child excess body weight. They observed body image, weight gain, eating behavior, psychopathology, and breastfeeding patterns during pregnancy and the postpartum period separately. Body dissatisfaction experienced during both

periods were associated with higher rates of disordered eating and postpartum depression. Researchers state there was a stronger relationship between postpartum depression and body dissatisfaction experienced postpartum than during pregnancy. They concluded this relationship impacted the quality of the mother-to-child relationship, leading to less breastfeeding and a poorer mother-to-child bond. Based on these, Bergeimer et al., (2020) suggest that postpartum visits should comprehensively assess the mother's wellbeing, body image, and weight concerns.

Easter et al., (2014) performed a longitudinal nonexperimental study to determine the relationship between anxiety, depression, and eating disorders among mothers. The researchers followed women between ages 18-45 throughout their pregnancy and postpartum period to assess for psychopathology among those with current and past eating disorders. A total of 137 women were recruited. There were three groups: healthy control with no history of eating disorders, current eating disorders, and past eating disorders. Eating disorders included Anorexia Nervosa, Bulimia Nervosa, Binge-Eating Disorder, and Eating Disorders Not Otherwise Specified. Anxiety, depression, and eating disorders were measured during the first/second trimester, at the third trimester, 8 weeks, and 6 months postpartum. Anxiety was measured using the Spielberger State-Trait Anxiety Inventory, depression was measured with the Becks Depression Inventory, and eating disorders were measured with the Eating Disorders Examination Questionnaire. All three were administered alongside an objective and in-depth psychological interview. The researchers did not report the reliability or validity of tools based on previous literature or their own findings. The current eating disorders and past eating disorders group had statistically significant higher depression scores across all time periods. Eating disorder scores remained relatively high and constant for the current eating disorders group. These scores gradually increased over time reaching their peak at the 6-month postpartum

mark for the past eating disorders group. The healthy control group remained relatively low, but eating disorder symptoms spiked at the third trimester. The researchers state that their main limitation consists of their small sample size, which affects generalizability and ability to detect differences among groups.

Riquin et al., (2019) performed a longitudinal non-experimental study in France on women beginning from the start of pregnancy all the way through the postpartum period to determine their relationship between depression, body dissatisfaction, and disordered eating. The researchers had the women complete the Edinburgh Postnatal Depression Scale (EPDS), Eating Disorder Examination Questionnaire (EDE-Q), Body Satisfaction Questionnaire (BSQ), and Pictorial Body Image Scale (PBIS) to measure these variables at the fourth month of pregnancy (T1), eighth of pregnancy (T2), and sixth to eight week postpartum (T3). They originally recruited 457 women with a final sample of 160 women who completed the study at all three time periods. From this, 15% of women in the T3 era were identified as depressed. At T1, 40% were dissatisfied with their body shape and 13% of women had body shape concerns. Among the sample, 29.6% had a history of eating disorders with 9.8% falling under bulimia and 7.5% falling under anorexia nervosa. 6.3% were currently facing an eating disorder. After data analysis, they report that 33% of women with body image dissatisfaction experienced perinatal depression, which was three times higher than those who were not dissatisfied with their body image. Disordered eating symptomatology was significantly higher among those depressed than those who were not and among those dissatisfied with their body image than those who were not. The researchers acknowledge the attrition bias stating that there likely would have been higher rates of depression had there not been a loss of participants.

Maihara dos Santos, et al., (2017) conducted a cross-sectional nonexperimental study to determine if there was an association between eating disorders and depressive and anxious symptomatology among 913 pregnant women in their 2nd or 3rd trimester. The Structured Clinical Interview for DSM Disorders (SCID) was administered to assess eating disorders including Anorexia Nervosa, Bulimia Nervosa, Binge-Eating Disorder, and pica. The Hospital Anxiety and Depression (HAD) screening tool was used for anxiety and depression. Eight percent of participants tested positive for an eating disorder with pica being the most common. They reported a significant positive correlation between perinatal eating disorders and depressive and/or anxious symptomatology. Researchers stated that the exclusion of pica would likely result in lower correlational scores. They further proposed that perhaps those with eating disorders are more likely to have body image and self-esteem issues, which can precipitate psychiatric disorders. However, while their research did not examine the relationship between body image, self-esteem issues and psychiatric disorders, they propose this as a future topic to explore.

The six-week postpartum checkup is the standard time to follow-up to follow up with mother after delivery and often occurs between four-to-eight weeks (American Academy of Pediatrics Committee on Fetus and Newborn & American College of Obstetricians and Gynecologists Committee on Obstetric Practice, 2017). While factors such as breastfeeding and contraceptive methods are discussed, Fowles et al., (2012) states that psychological needs are seldom met. Assessing the presence of postpartum depression and disordered eating are important in the postpartum period, especially at the four-to-eight week mark, which literature has established as close to the time period where both disorders are likely to develop (ACOG, 2019; Hawkins & Gotlieb, 2013). While previous literature has highlighted the prevalence of postpartum depression or disordered eating among postpartum women and the implications they

carry for mothers, other studies have gone further to establish a relationship between the two (Bauman et al., 2020; Bergeimer et al., 2020; Easter et al., 2014; Fogarty et al., 2018; Maihara dos Santos et al., 2017; Nimisha et al., 2012; Peterson et al., 2016; & Riquin et al., 2019) Despite this, current studies observing a relationship between disordered eating and postpartum depression either investigate these problems beyond four-to-eight weeks or do not clearly identify the time period studied. Knowing if there is a correlation between the two factors during this time frame could inform practice and even become a standard time to assess and intervene. This purpose of this study is to identify if higher scores of suspected disordered eating correlate with higher scores of postpartum depression at the four-to-eight week period after delivery. If mothers four-to-eight weeks postpartum experience symptoms of disordered eating, they are more likely to experience symptoms of postpartum depression.

Methods

Design

A cross-sectional quantitative study was used to observe whether there is a correlation between disordered eating and postpartum depression among women four-to-eight weeks postpartum. IRB approval was received through exempt review at the University of Tennessee, Knoxville. Data was collected remotely using an anonymous online Qualtrics survey. This survey was accessed through posters that included a link and QR code where participants could access the survey. The beginning of the survey began with the inclusion criteria and informed consent that participants were asked to agree or disagree to. Disagreeing led participants to a page where they were asked to exit the survey while agreeing directed them to the first page to fill out demographic information. These questions asked for their age, race, ethnicity (hispanic/latino or non hispanic/latino), if they have delivered a baby after 20 weeks of

pregnancy before or if their recent delivery was their first time, and if their partner is involved with their pregnancy. If the participant answered no to having an involved partner, a follow-up question asked if they had someone else supporting them through the pregnancy (see Table 1). If participants chose to continue, they were led to fill out the Edinburgh Postpartum Depression Scale (EPDS), which is a ten-item questionnaire that assesses for postpartum depression (see Appendix B). From here, they were also led into filling out the Eating Disorders Examination Questionnaire (EDE-Q), which is 28-item questionnaire that measure for disordered eating (see Appendix A). Once completing this survey, participants entered their email address in a separate Qualtrics survey to receive their ten dollar gift card. This further protected anonymity by ensuring emails could not be attached to the responses. There were options at the end of each page of the survey for participants to quit if they chose to do so. If they chose to quit, they were still offered the gift card. Gift cards were ordered and sent within two weeks that each email was received.

Sampling

A convenience sample of four-to-eight week postpartum mothers were recruited through posters set up in the Premier Medical Group OB/GYN clinic in Clarksville, TN that advertised the study. Inclusion criteria included being 18 years or older, being four-to-eight weeks postpartum, being able to read and speak in English, having no alterations in mental status, accepting to participate, and signing the consent form. The ideal proposed sample size was reaching fifty participants.

Measures

All data was analyzed in SPSS 28. A Shapiro Wilk's test was used to test normality. A Spearman Correlation Test was used to test for correlation between the EPDS and EDE-Q. A

Man-Whitney t-test was calculated to determine correlation between the EPDS and two-group variables demographics including race, ethnicity, parity, and support status. A Wilcoxon t-test was calculated to determine correlation between two-plus-group variables, which was age. A Cronbach Alpha Score was calculated for each of the instruments to test for reliability. For descriptive statistics, means were calculated for age and frequencies were reported for race, ethnicity, parity status, involved partner status, and support person status.

The EPDS is the most frequently used validated tool to identify postpartum depression in the clinical setting (Hewitt et al., 2010). It can be filled out by the patient or administered by a healthcare provider taking an average of five minutes to complete (Cox et al., 1987). It is recommended by ACOG (2018) to be administered at least once during the postpartum period. While they do not specify a specific time period to administer the tool, Ezirim et al., (2021) validated its use around the six-week postpartum period. It asks women to recall their mood and behaviors from the past seven days. Total scores are categorized into four levels of interpretation: less than 8 indicates depression not likely, 9-11 indicates depression probable, 12-13 indicates fairly high possibility of depression; and 14 and higher indicates probable depression (Perinatal Services BC, 2015). This was administered in an online, remote format, which Drake et al., (2014) found to be easier, more accessible, and less intimidating for mothers to fill out versus an in-person administration format.

The EDE-Q is originally a twenty-eight item self-report questionnaire that asks about thoughts and behaviors within the past 28 days. It is derived from the Eating Disorder Examination (EDE), which is considered the “gold standard” of eating disorder assessment and is used in many treatment studies (Guest, 2000). However, as the EDE must be administered by a behavioral health professional, the EDE-Q presented as the most practical tool to use. The EDE-

Q contains four subscales: restraint, eating concern, shape concern, and weight concern.

Additional questions measure for laxative misuse, vomiting, excess exercise, and binge eating. It has only been validated for use in community samples (Pettersson et al., 2016). It has yet to be validated for use among postpartum women specifically. Subscores for each of the four subscales as well as a global score can be calculated. There is no criteria provided to interpret the results based on the level of severity of disordered eating; however, higher scores indicate possible presence of disordered eating.

Findings and Results

There were a total of 22 surveys initiated; however, four participants chose to opt after starting the survey, leaving 18 fully completed survey results. The age of the participants ranged from 18 to 37 ($\bar{X}$ =27.67 years, SD =4.753 years). Race and ethnicity was self reported by participants (see Table 1). Parity status was obtained by asking if participants had previously delivered a baby after 20 weeks of pregnancy. 11 participants reported yes while 7 participants reported no. Support status was examined with 12 participants reporting they had an involved partner while 6 stated they did not. Of these 6 participants, 3 stated they had a support person outside of a partnership (see Table 1).

Total EPDS scores had a Cronbach alpha score of .877, showing good internal consistency. EPDS total scores are categorized into three categories: a total score of 8 or less suggests that depression is not likely (n =7, 39%), 9-11 qualifies as depression probable (n =2, 11%), 12-13 shows fairly high possibility of depression (n =3, 17%), and 14 and higher indicates probable depression (n =6, 33%). There was a normal distribution found within EPDS scores (p =0.493). Total EDE-Q scores also demonstrated good internal consistency with a Cronbach alpha score of 0.979. The four EDE-Q subscales also showed sufficient internal consistency:

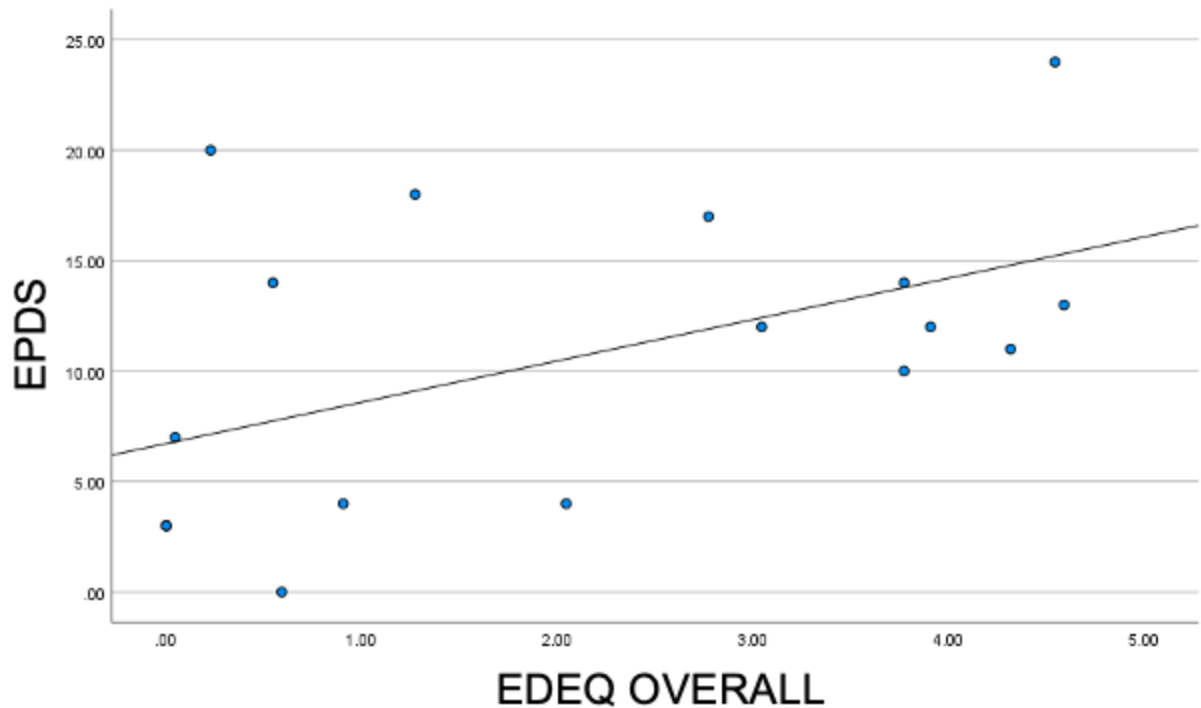
restraint ($\alpha=0.938$), eating concern ($\alpha=0.944$), shape concern ($\alpha=0.969$), and weight concern ($\alpha=0.923$). The mean global score was 2.02 (SD=1.784). Mean scores were also calculated for the subcategories involving restraint ($\bar{X}=1.59$, SD=1.784), eating concern ($\bar{X}=1.47$, SD=1.784), shape concern ($\bar{X}=2.34$, SD=2.044), and weight concern ($\bar{X}=2.37$, SD=2.018). The weight concern category was the only scale with a normal distribution ($p=0.101$) while the others as well as the total scores were not normally distributed ($p<0.05$) according to the Shapiro-Wilk test. Thus, all were treated as nonparametric when running Spearman correlation tests.

Questions 13-18 required that participants type out the number of times or days they had exhibited a certain behavior. 77.8% of participants reported 0 days/times for everything. Further, all of the participants reported that they had never made themselves sick (vomit) as a means of controlling shape or weight (question 15), taken laxatives as a means of controlling shape or weight (question 16), or exercised in a way as a means of controlling weight, shape, or amount of fat or to burn off calories (question 17) over the past 28 days. For question 13 that asked how many times one has eaten what other people would regard as an unusually large amount of food (given the circumstances), 2 respondents reported 5 times, 1 respondent reported 20 times, and 1 respondent reported 28 times over the past 28 days. For question 14 asking how many of these times did one have a sense of having lost control over your eating (at the time that you were eating), 2 participants reported 2 times and 1 participant reported 14 times. For question 18 that asks over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food and have had a sense of loss of control at the time), 1 participant reported 3 days, 1 participant reported 4 days, and 1 participant reported 5 days.

A Spearman's correlation test was performed to determine correlations between overall EPDS and EDE-Q scores as well as EPDS scores with each EDE-Q subscale. A statistically significant positive correlation was found between EPDS and EDE-Q total scores ($p=0.033$) (see Figure 1). Among the subscales, a statistically significant positive correlation was found between the EPDS and eating concern ($p=0.049$), shape concern ($p=0.015$), and weight concern ($p=0.027$). There was not a significant correlation found with restraint however ($p=0.215$).

Figure 1

Correlation Between EDE-Q Scores and EPDS Scores



Note: Scatterplot showing a positive statistical correlation between EPDS and EDE-Q score. As EDE-Q scores go up, EPDS scores follow suit.

While the focus of this study is on the correlation between the EPDS and EDE-Q, correlational statistics were performed between demographics. A Spearman's correlation tests was run on EPDS scores and reported age. No statistically significant correlation was found between the two factors ($\rho = -0.018$, $p = 0.943$). An independent sample t-test was run between EPDS scores and parity status, partner status, and support status respectively. No statistical relationship was found between prior delivery after 20 weeks of pregnancy and EPDS scores ($p = 0.525$). However, a significant difference was found with EPDS scores between those that reported they did not have a partner and those that did ($p = 0.032$). Those that had a partner involved had a median score of 5.5 whereas those without a partner had a median of 15.0. When running this test on support status, there was no significant difference found between either

answer (involved support person or no involved support person) ($p=1.000$). Those with a partner had lower EPDS scores than those with no partner with or without support.

Discussion

While studies have established that disordered eating and postpartum depression are typically present during the first few weeks of the postpartum period, few have observed whether there is a correlation between the two factors at the four-to-eight week postpartum period (Bergmeier et al., 2020; Fogarty et al., 2018; Hawkins & Gotllieb, 2013; & Petterson et al., 2016). This study found that a positive correlation between higher scores of EPDS and higher scores of EDE-Q at four-to-eight weeks postpartum (Easter et al., 2014; Fogarty et al., 2018; Peterson et al., 2016; & Riquin et al., 2019). This finding suggests that as symptoms of disordered eating increase, symptoms of postpartum depression increase as well. Further, higher EPDS scores correlate with higher levels of eating concern, shape concern, and weight concern, which follows prior findings found between body dissatisfaction and postpartum depression (Bergeimer et al., 2020). Interestingly, restraint had no correlation whatsoever with EPDS scores.

Another interesting finding unrelated to the correlation between disordered eating and postpartum depression symptomatology was related to the presence of a support person. Nimisha et al., 2012 found that those with multiple births and a lack of a partner and/or support person were risk factors correlated with higher rates of postpartum depression; however, data from this study highlights a lack of a partner as the only risk factor associated with higher rates of postpartum depression. Even when testing for the presence of a support-type person among those without a partner, it had no significant impact on EPDS scores. Those with a partner had a mean EPDS score that fit under the “depression is not likely” category; whereas, those without a partner, regardless of the presence of another type of support, had a mean EPDS score that

suggests probable depression. This suggests that the presence of a solid partner is the key factor in determining which side of the postpartum depression spectrum one falls into. Alternatively, there may not have been enough power in the sample size of participants who had experienced multiple births and/or a lack of a support person to reasonably conflict with this observation.

Bauman et al., 2020 also found that those 19 and under were more likely to report symptoms of postpartum depression, but this study only recruited participants 18 and up and found no correlation with age. However, this is not an unwarranted finding. Perhaps if those under 18 were included as well, there would have been similar findings. Correlational analysis was only performed between the EPDS and demographic characteristics. Demographics were not run with the EDE-Q to avoid oversaturation given the number of data points the EDE-Q provides.

However, it is not unreasonable to consider a similar relationship between certain demographics and elevated EDE-Q scores with the pre-existing correlation between EPDS scores and the EDE-Q.

Limitations

The small number of participants recruited from a convenience sample at a single clinic limits the generalizability of these findings to a broader context of postpartum women. Because data was only collected at this location, under coverage bias is likely present. Another limit is that data collection was not conducted in person; hence, these results were drawn on the basis that participants were honest about their eligibility to participate and within their actual answers—an assumption that cannot be necessarily proven correct. While the EDE-Q showed good internal consistency and has been utilized by many other studies, it has not been officially validated for use in the clinical setting among postpartum women. Further, it does not have a clear scoring guide breaking down the scores into ranges that indicate what level of disordered eating severity

one falls under. Additionally, while the EPDS is a validated tool and is statistically reliable, it is important to note that neither tool is diagnostic and only suggests the presence of disordered eating and postpartum depression symptoms. While the scores can reflect levels of associated symptoms, the major finding from this study is not to be mistaken as a correlation between diagnosed postpartum depression and disordered eating. Such would require in-person evaluation by a relevant licensed professional through a behavioral health consult. Also, disordered eating is not necessarily a clinical diagnosis and rather is an umbrella term to encompass a variety of factors that play into this negative behavior. Further, since both tools are self report and require the participant to recall how often a certain behavior occurred, recall bias may have occurred where participants were not accurately reflecting their experiences in the survey.

Implications for Further Research

This study alone imparts many opportunities for future research. The exact methods used within this report could be applied to a much larger, more diverse population in order to expand the generalizability of the results. The much-needed avenue to explore involves actual assessment of these two disorders within the clinical setting and subsequently testing the effectiveness of appropriate interventions to reduce the presence/risk of such conditions.

Conclusion

The results of this study in conjunction with prior findings within this field only further highlight the need to address disordered eating and postpartum depression among postpartum women. While the focus often shifts from the mother to the infant after delivery, it is important to keep mothers in mind during this very vulnerable period. Assessment and intervention of these issues in the clinic are important measures to take because disordered eating and postpartum depression negatively affect both the mother and child's mental and physical health. They may

even lead to dire consequences that include maternal suicide and infanticide (Center for Disease Control, 2020; Palladino, 2011). The literature has clearly demonstrated that these are common issues among this population, so healthcare workers should be proactive in inquiring about signs of the two conditions. Walsh et al., (2000) suggests the importance of assessing eating and exercise habits as well as attitudes towards weight and body shape. Given the correlation of increasing disordered eating symptomology with increasing postpartum depression symptoms observed in this study, postpartum persons presenting with symptoms of either disorder should be screened for the presence of the other. Routine screening for disordered eating and postpartum depression is necessary to ensure identification and intervention for these disorders, which ultimately supports the health and safety of both the mother and child.

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Table 1

Table representing the statistics of the demographic within the study sample

Demographic		
Age	$\bar{x}$	$\pm SD$
	27.6	± 4.753
	7	
Race & Ethnicity	n	%
American Indian	0	0
Asian	2	11
Black or African American	4	22
Native Hawaiian or Other Pacific Islander	0	0
White	11	61
Other	0	0
Hispanic or Latino	2	11
Not Hispanic or Latino	16	88
Parity Status		
Yes	11	61
No	6	33
Involved Partner		
Yes	12	66
No	6	33
If no partner, has support person		
Yes	3	50
No	3	50

Note. Table reporting mean and standard deviation for age and frequencies and percentages for race, ethnicity, parity status, partner status, and support status

Appendix A



Eating Disorder examination questionnaire (EDE-Q 6.0)

Instructions: The following questions are concerned with the past four weeks (28 days) only.

Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

	ON HOW MANY OF THE PAST 28 DAYS ...	NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
1	Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4	Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a totally flat stomach?	0	1	2	3	4	5	6
7	Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

PAGE 1/3 PLEASE GO TO THE NEXT PAGE



Eating Disorder examination questionnaire (EDE-Q 6.0)

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days)....

13	Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?	
14	... On how many of these times did you have a sense of having lost control over your eating (at the time you were eating)?	
15	Over the past 28 days, on how many DAYS have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food and have had a sense of loss of control at the time)?	
16	Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?	
17	Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight?	
18	Over the past 28 days, how many times have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	

Questions 19 to 21: Please circle the appropriate number. Please note that for these questions the term "binge eating" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

		NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
19	Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? ... Do not count episodes of binge eating.	0	1	2	3	4	5	6
		NONE OF THE TIMES	A FEW OF THE TIMES	LESS THAN HALF	HALF OF THE TIMES	MORE THAN HALF	MOST OF THE TIME	EVERY TIME
20	On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ... Do not count episodes of binge eating.	0	1	2	3	4	5	6
		NOT AT ALL		SLIGHTLY	MODERATELY		MARKEDLY	
21	Over the past 28 days, how concerned have you been about other people seeing you eat? ... Do not count episodes of binge eating.	0	1	2	3	4	5	6

PAGE 2/3 PLEASE GO TO THE NEXT PAGE



Eating Disorder examination questionnaire (EDE-Q 6.0)

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

	ON HOW MANY OVER THE PAST 28 DAYS ...	NOT AT ALL MARKEDLY		SLIGHTLY		MODERATELY		
22	Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your weight ?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your shape ?	0	1	2	3	4	5	6
27	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28	How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.):

What is your height? (Please give your best estimate.):

If female: Over the past three to four months have you missed any menstrual periods?: YES ☐ NO ☐

If so, how many?:

Have you been taking the "pill"?: YES ☐ NO ☐

PAGE 3/3

THANK YOU

degree not quite severe enough to justify a rating of 6. A rating of 3 should be used for degrees of severity midway between 0 and 6. *If it is difficult to decide between two ratings, the lower rating (i.e., the less symptomatic) should be chosen.* [The exception is the first item "Pattern of eating" in which higher scores are (with the exception of nocturnal eating) less symptomatic.] This general rating scheme is summarised in Table 1.

SCORING

The EDE, and its self-report version, the EDE-Q, generate two types of data. First, they provide frequency data on key behavioural features of eating disorders in terms of number of episodes of the behaviour and in some instances number of days on which the behaviour has occurred. Second, they provide subscale scores reflecting the severity of aspects of the psychopathology of eating disorders. The subscales are Restraint, Eating Concern, Shape Concern and Weight Concern. To obtain a particular subscale score, the ratings for the relevant items (listed below) are added together and the sum divided by the total number of items forming the subscale. If ratings are only available on some items, a score may nevertheless be obtained by dividing the resulting total by the number of rated items so long as more than half the items have been rated. To obtain an overall or 'global' score, the four subscales scores are summed and the resulting total divided by the number of subscales (i.e. four). Subscale scores are reported as means and standard deviations.

Subscale Items (the numbers are the item number on the EDE-Q):

Restraint

- 1 Restraint over eating
- 2 Avoidance of eating
- 3 Food avoidance
- 4 Dietary Rules
- 5 Empty stomach

Eating Concern

- 7 Preoccupation with food, eating or calories
- 9 Fear of losing control over eating
- 19 Eating in secret
- 21 Social eating
- 20 Guilt about eating

Shape Concern

- 6 Flat stomach
- 8 Preoccupation with shape or weight
- 23 Importance of shape
- 10 Fear of weight gain
- 26 Dissatisfaction with shape
- 27 Discomfort seeing body
- 28 Avoidance of exposure
- 11 Feelings of fatness

Weight Concern

22 Importance of weight

24 Reaction to prescribed weighing

8 Preoccupation with shape or weight

25 Dissatisfaction with weight

12 Desire to lose weight

COMMUNITY NORMS

The data below are from a community-based sample of 243 young women assessed using the EDE and EDE-Q (see Fairburn and Beglin, 1994).

Measure	Mean	SD	N
EDE interview			
Global EDE (4 subscales)	0.932	0.805	243
Restraint subscale	0.942	1.093	243
Eating Concern subscale	0.266	0.593	243
Shape Concern subscale	1.339	1.093	243
Weight Concern subscale	1.181	0.929	243
EDE Q			
Global EDE (4 subscales)	1.404	1.130	241
Restraint subscale	1.251	1.323	241
Eating Concern subscale	0.624	0.859	241
Shape Concern subscale	2.149	1.602	241
Weight Concern subscale	1.587	1.369	241

GENERATING DSM-5 EATING DISORDER DIAGNOSES**ANOREXIA NERVOSA**

Criterion A – Restriction of energy requirements leading to a significantly low weight in the context of age, sex, developmental trajectory, and physical health.

Definition

- The participant's height and weight should be measured and age ascertained. Then the DSM-5 guidelines (p. 339-340) for deciding what constitutes a "significantly low weight" should be applied
- **And** "Maintained low weight" should have been rated 1 or 2.

Criterion B – Intense fear of gaining weight or of becoming fat, or persistent behaviour that interferes with weight gain, even though significantly low weight.

Definition

Appendix B

Edinburgh Perinatal/Postnatal Depression Scale (EPDS)

SCORING GUIDE

1. I have been able to laugh and see the funny side of things
 - 0 As much as I always could
 - 1 Not quite so much now
 - 2 Definitely not so much now
 - 3 Not at all
2. I have looked forward with enjoyment to things
 - 0 As much as I ever did
 - 1 Rather less than I used to
 - 2 Definitely less than I used to
 - 3 Hardly at all
3. I have blamed myself unnecessarily when things went wrong
 - 3 Yes, most of the time
 - 2 Yes, some of the time
 - 1 Not very often
 - 0 No, never
4. I have been anxious or worried for no good reason
 - 0 No, not at all
 - 1 Hardly ever
 - 2 Yes, sometimes
 - 3 Yes, very often
5. I have felt scared or panicky for no very good reason
 - 3 Yes, quite a lot
 - 2 Yes, sometimes
 - 1 No, not much
 - 0 No, not at all
6. Things have been getting on top of me
 - 3 Yes, most of the time I haven't been able to cope
 - 2 Yes, sometimes I haven't been coping as well as usual
 - 1 No, most of the time I have coped quite well
 - 0 No, I have been coping as well as ever
7. I have been so unhappy that I have had difficulty sleeping
 - 3 Yes, most of the time
 - 2 Yes, sometimes
 - 1 Not very often
 - 0 No, not at all
8. I have felt sad or miserable
 - 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Not very often
 - 0 No, not at all
9. I have been so unhappy that I have been crying
 - 3 Yes, most of the time
 - 2 Yes, quite often
 - 1 Only occasionally
 - 0 No, never
10. The thought of harming myself has occurred to me
 - 3 Yes, quite often
 - 2 Sometimes
 - 1 Hardly ever
 - 0 Never

EPDS Score	Interpretation	Action
Less than 8	Depression not likely	Continue support
9–11	Depression possible	Support, re-screen in 2–4 weeks. Consider referral to primary care provider (PCP).
12–13	Fairly high possibility of depression	Monitor, support and offer education. Refer to PCP.
14 and higher (positive screen)	Probable depression	Diagnostic assessment and treatment by PCP and/or specialist.
Positive score (1, 2 or 3) on question 10 (suicidality risk)		Immediate discussion required. Refer to PCP ± mental health specialist or emergency resource for further assessment and intervention as appropriate. Urgency of referral will depend on several factors including: whether the suicidal ideation is accompanied by a plan, whether there has been a history of suicide attempts, whether symptoms of a psychotic disorder are present and/or there is concern about harm to the baby.

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