



## Symptoms of eating disorders and feeding practices in obese mothers



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### ABSTRACT

**Background:** The potential that obesity in pregnancy has to affect symptoms associated with eating disorders and breastfeeding is unclear.

**Aim:** This study analyzed symptoms of eating disorders and breastfeeding practices in obese mothers.

**Study design:** Prospective, case–control study.

**Subjects:** Participants included 25 obese (BMI > 30 kg/m<sup>2</sup>) and 25 normal-weight puerperae, matched for parity and delivery route.

**Outcome measures:** The participants completed the Eating Disorders Inventory (EDI-2), investigating cognitive, emotional, and behavioral symptoms of eating disorders before they were discharged from the maternity hospital and later participated in telephone interviews concerning breastfeeding practices which were classified according to WHO definitions.

**Results:** Although none of the scores fell in the pathological range, the obese mothers had more and more pronounced symptoms of eating disorders in all EDI-2 subscales with respect to normal-weight mothers. They had, in particular, significantly higher scores in body dissatisfaction ( $p < .0001$ ), ineffectiveness ( $p = .004$ ), interoceptive awareness ( $p = .005$ ), and maturity fear ( $p = .007$ ). Finally, while breastfeeding practices were similar in the two groups, the obese mothers were more likely to maintain full breastfeeding at 6 months (20 vs 8%) and their tendency to postpone weaning was found to be significant ( $p < .04$ ).

**Conclusions:** While the obese mothers studied have more pronounced symptoms of eating disorders with respect to their normal-weight counterparts, they tended to maintain breastfeeding longer, postponing weaning.

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### 1. Introduction

Obesity is a growing global problem [1]. Statistics on obesity in pregnant women in the United States report that approximately 18.5% to 38% of that population are obese, which makes it one of the country's most frequent high-risk obstetric situations [2]. A recent Australian study reported that 34% of that nation's pregnant women were overweight or obese and that obese puerperae had increased adverse maternal and neonatal outcomes, resulting in higher obstetric care costs [3]. As the prevalence of maternal obesity has risen dramatically in recent years and obesity is a problem that crosses generations, prevention has become an urgent priority [4].

A number of studies have found lower breastfeeding rates in obese women with respect to their normal-weight counterparts [5–7], and some have hypothesized that the increased use of formula milk will lead to a greater risk of obesity in childhood [8,9]. Some researchers have attributed the former to physiological causes, such as delayed lactogenesis [10] and/or lower prolactin response [11]. These biological

effects are, however, strongly influenced by confounding, in which maternal factors (e.g., parental obesity and socioeconomic status) or psychological and behavioral factors are of particular importance to feeding decisions [7].

During pregnancy, conflicts about body changes, alterations in roles, additions of responsibility, and concerns about a woman's own mothering abilities are prevalent. Many of these concerns are also directly linked to puerperium, a period during which previously dormant psychological issues such as fears about physical changes, role adaptation, psychosocial stress, and mothering abilities come to the surface also of great importance to the psychology of lactation [12].

Despite the facts that eating disorders affect a large percentage of adolescent females [13], the number of obese women in child-bearing age is climbing [14], and pregnancy is a period of important developmental changes, little is known about how obesity in pregnancy can affect breastfeeding.

To date, no published study has examined this issue from the perspective of obese puerperae and no studies have analyzed eating disorder symptoms and breastfeeding success in this population. The aim of this study was, then, to examine the relationship between maternal obesity, symptoms of eating disorders, and breastfeeding initiation and duration.

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## 2. Methods

*2.1. During a recent longitudinal prospective study to evaluate body image and breastfeeding practices in obese mothers [15], we planned additional analyses to determine if maternal obesity is associated with symptoms of eating disorders*

Twenty-five consecutive, healthy, full-term, obese (BMI > 30 kg/m<sup>2</sup>) pregnant women presenting at a tertiary medical center between January and June 2011 were studied. The control group consisted of 25 healthy, full-term, normal-weight pregnant women matched for parity and delivery route.

Every obese woman who gave birth to a full-term infant and the first normal-weight woman who gave birth afterwards were considered eligible. Inclusion criteria for both the study and control groups were: Italian-speaking women older than 18 who were not being treated for psychological disorders at the time of recruitment and who gave birth after at least 37 weeks of gestation to healthy, single infants without medical complications. Of the 81 women who were initially contacted, 50 met the inclusion criteria and were recruited for the study (Table 1).

This prospective, case–control study is the outcome of the collaborative efforts of the Department of Pediatrics and the Department of Obstetrics and Gynecology of the University of Padua Medical Center. Granted by the approval of the Medical Faculty's ethics committee, the study was carried out in accordance with the Declaration of Helsinki. After being informed about the study's aims and methods, the participants (obese and normal-weight women) signed informed consent forms.

All of the participants were assessed during their hospital stay, usually one day before they were discharged and generally three to four days after birth. At that time the participants were asked to fill out the Eating Disorders Inventory, (EDI-2; Psychological Assessment Resources, Inc., Odessa, FL 1968) [16,17] and their clinical and demographic characteristics were reviewed.

The EDI is a self-report questionnaire used to assess cognitive, emotional, and behavioral symptoms of eating disorders. The EDI-1 comprises 64 questions, divided into eight subscales: drive for thinness, ineffectiveness, body dissatisfaction, interpersonal distrust, bulimia, perfectionism, maturity fears, and interoceptive awareness. The EDI-2, the edition of the inventory that was used in this study, included 27 additional items and 3 subscales: impulse regulation, social insecurity, and asceticism. All the subscales of the EDI-2 were used in this study. The inventory employs a 6-point Likert response scale (ranging from 'always' to 'never', rated 0–3). The score is calculated by summing the scores for each sub-scale. Higher scores are indicative of more symptoms [18]. The EDI-2 has high test–retest reliability ( $r = 0.75$  to  $0.94$ ), good internal consistency (Cronbach's  $\alpha = 0.73$  to  $0.93$ ), and has been used extensively [18].

All of the participants taking part in the study were given information about the relationship between gestational obesity, symptoms predictive of eating disorders, and breastfeeding success. As is the normal

practice in our center, all of the participants were encouraged to breastfeed even while they were still in the delivery room during the first minutes after birth. Those mothers agreeing to the rooming-in regimen offered by the hospital were never separated from their newborns who were breast-fed ad libitum and weighed once a day. Those mothers who preferred to use formula feeding offered their infants a bottle-fed formula following a 3-hour schedule.

Infant feeding data were recorded in accordance with the definitions of the World Health Organization (exclusive breastfeeding is defined as only maternal milk and nothing else; complementary breastfeeding is defined as a combination of breast milk and formula; and exclusive formula feeding is defined as offering exclusively bottle-fed formula) [19].

Feeding practices during the hospital stay were collected directly from the patients themselves and from their medical records. Breastfeeding patterns after discharge from the hospital and weaning data (the transition from breast-feeding or formula milk to semi-solid foods) were collected from the mothers by a trained professional during the follow-up telephone interviews that were held one, three, and six months later. At each interview, the mothers were asked to indicate with a yes/no response if they were still breastfeeding. At the 3- and 6-month interviews the mothers were queried if and when they had begun to wean their infants. On the basis of the mother's answers of yes or no, we defined the end of breastfeeding and beginning of weaning as 1, 3 or 6 months. This and all other pertinent information were collected and used in the following analyses.

### 2.2. Statistical analyses

The patients' weights (in kg) were converted into BMI units to facilitate the comparison between groups. A descriptive analysis was used to construct a qualitative evaluation of the participants' clinical data, their responses to the questionnaires, and their breastfeeding outcomes. Continuous variables were expressed as means and standard deviation (SD). Categorical data were compared using Fisher's exact test, while continuous data were compared using the Student's test. A p-value less than .05 was considered significant. Statistical analysis was performed using R 2.12 software.

## 3. Results

While the obese mothers were free of psychopathology, they showed more frequent symptoms of eating disorders on all EDI-2 subscales with respect to their normal-weight counterparts. The obese mothers had, in fact, significantly higher scores in body dissatisfaction ( $P < .0001$ ), ineffectiveness ( $P = .004$ ), interoceptive awareness ( $p = .005$ ), and maturity fear ( $p = .007$ ) (Table 1).

Finally, while the breastfeeding practices were similar in the two groups, the obese mothers were more likely to maintain full breastfeeding even 6 months after birth (20 vs 8%) and their tendency to postpone weaning was found to be significant ( $p < .04$ ) (Table 2).

**Table 1**  
Eating disorder inventory-2 subscale scores (mean  $\pm$  SD).

Mothers	Obese	Normal-weight	p-Value
<i>EDI-2 subscale</i>			
Drive for thinness	3.24 $\pm$ 2.6	1.36 $\pm$ 1.7	.08
Bulimia	1.24 $\pm$ 3.73	0.48 $\pm$ 0.92	.08
Body dissatisfaction	9.4 $\pm$ 4.3	3.28 $\pm$ 4.24	.0001
Ineffectiveness	4.36 $\pm$ 0.82	2.12 $\pm$ 3.66	.004
Perfectionism	1.48 $\pm$ 5.51	1 $\pm$ 1.35	.17
Interpersonal distrust	2.92 $\pm$ 1.48	2 $\pm$ 2.99	.06
Interoceptive awareness	1.36 $\pm$ 1.61	0.6 $\pm$ 1.5	.005
Maturity fear	5.04 $\pm$ 3.58	2.72 $\pm$ 2.42	.007
Asceticism	3.4 $\pm$ 1.32	3.28 $\pm$ 2.07	.91
Impulse regulation	2.24 $\pm$ 2.66	0.88 $\pm$ 1.69	.008
Social insecurity	4.6 $\pm$ 3.17	4.12 $\pm$ 4.85	.85

**Table 2**  
Breastfeeding and weaning practices in obese and normal-weight mothers.

Mothers	Obese	Normal-weight	p-Value
N.	25	25	
Breastfeeding at discharge, N (%)			.27
Exclusive	22 (88)	18 (72)	
Complementary	3 (2)	4 (16)	
Formula	0	3 (12)	
Breastfeeding discontinuation, N (%)			.50
1 month	1 [4]	2 [8]	
3 months	1 [4]	3 [12]	
6 months	23 (92)	20 (80)	
Weaning age (month), N(%)			.04
3 months	7 [28]	1 [4]	
6 months	18 (72)	24 (96)	

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