



# The impact of maternal overweight and emotion regulation on early eating behaviors



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## ABSTRACT

<sup>1</sup>Empirical data indicate that the risk for childhood obesity and overweight increases when one or both parents are overweight or obese. Such an association, however, cannot be entirely explained only by biological factors. Based on available literature, we hypothesized that maternal emotion regulation might play a role in explaining the intergenerational transfer of overweight and obesity. We conducted a quasi-experimental, longitudinal study: (step I) during the third trimester of pregnancy of 65 Italian women (33 overweight and 32 non-overweight), the Difficulties in Emotion Regulation Scale were administered to assess the quality of their emotion regulation strategies; and (step II) seven months after the delivery, the feeding interactions between the participants and their babies were evaluated in a 20-minute video-recording, by using the Italian version of the Observational Scale for Mother–Infant Interaction during Feeding. When compared to the non-overweight group, the overweight group had more difficulties in emotion regulation, was more psychologically distressed, and had poorer feeding interactions with their babies. Perhaps more importantly, the extent to which the participants were suffering difficulties in emotion regulation during pregnancy predicted, significantly, and beyond the effects of pre-pregnancy maternal weight, the quality of the mother–child feeding interactions 7 months after the delivery.

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## 1. Introduction

Overweight and obesity consist of an imbalance between calorie intake and expenditure. Overweight individuals have a Body Mass Index (BMI; weight in kilograms divided by the square of the height in meters) between 25 and 30 while obese individuals have a BMI greater than 30. These rapidly increasing conditions are primarily diet-induced, resulting from sustained excess of energy dense, high fat, and refined carbohydrate content foods, as well as insufficient consumption of fruits and vegetables. The increasingly sedentary lifestyles and changing environments which restrict opportunities for physical activity, also contribute to their development.

Despite the high prevalence of these phenomena, to date the relationship between weight and psychological health remains controversial and poorly understood. A number of risk factors for overweight and obesity have been linked to demographic aspects, dietary habits,

social/environmental and cognitive factors (Van der Merwe, 2007). However, the specific psychological mechanisms through which these risk factors affect the attitude toward food and lifestyle, and consequently behavior and weight, have not been completely clarified.

Most of the research efforts are currently directed toward addressing the complex etiology underlying these conditions, by integrating genetic, physiological and psychological components. A growing body of research, in particular, shows that a central role in the development of obesity and overweight might be played by the parent–child relationship. Indeed, the risk among children to be overweight when one or both parents are overweight or obese dramatically increases as compared to peers from non-obesogenic environments, and such an association cannot be entirely explained by biological factors alone. Many researchers, indeed, have demonstrated that factors such as breast feeding duration (Agras & Mascola, 2005), use and length of bottle feeding, smoking during pregnancy (Owen, Martin, Whincup, Smith, & Cook, 2005), parental style, and their modeling of eating behaviors constitute major risk factors in promoting overweight during childhood and in later ages (Frankel et al., 2012). Furthermore, it has been reported that the provision, or not, of the emotional context of the feeding interaction with the baby (as being permissive or demanding, available or poorly tuned), strongly affects the eating habit of the child (Farrow & Blissett, 2008; Ventura & Birch, 2008).

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<sup>1</sup> This research is part of a larger and ongoing longitudinal investigation.

### 1.1. Emotion regulation and early feeding interactions

The caregiving system plays an important role in promoting the physical, emotional and social wellbeing of the baby. The ability to regulate emotions and internal states during the early stages of life is also linked to the caregiver's capacity to handle the emotional states of the child. A central role in this process, in particular, is played by what has been referred to as maternal sensitivity, i.e., the ability to appropriately, timely, and consistently respond to the baby's signals and needs. As Schore (2000) pointed out, indeed, during the first year of life the mother–infant dyad goes on as a mutually regulating biological unit, and the two elements of the dyad reciprocally affect themselves as a common system of regulation. Thus, the lack of maternal sensitivity likely undermines the development of emotion regulation skills in the baby.

In studying the process of development in this domain, the role of both internal and external sources of regulation during infancy and childhood has been investigated. The transition from using the parents for regulation of arousal to being able to self-regulate is a process that begins early and carries on through childhood (Calkins & Fox, 2002). The caregiver's role in this process is extensive: initially, the provision of food, clothing, and physical soothing assists the infant in state regulation; later, more complex communications and interactions with the caregiver teach the child how to manage distress, control impulses, and delay gratification. The process of developing emotion regulation skills and strategies, however, is fundamentally an interactive one, and depends on both infant and caregiver contributions. Its success or failure likely depends on whether the goals of both participants are in agreement (DiSantis, Collins, Fisher, & Davey, 2011; Velotti, Zavattini, & Garofalo, 2013).

The complex interplay between mother and child is also important in the development of the child's eating self-regulation (Anderson, Gooze, Lemeshow, & Whitaker, 2012). Indeed, because maternal sensitivity largely depends on the mother's ability to regulate her own emotions (Ammaniti, Ambrozzi, Lucarelli, Cimino, & D'Olimpio, 2004; Mills-Koonce et al., 2006), it has been suggested that the poor emotional functioning of the mother might in turn lead to the establishment of early eating problems of the baby, by affecting how much and what children eat during mealtime (Blissett & Farrow, 2007; Farrow & Blissett, 2006; Hughes et al., 2011). For instance, if parent–child exchanges are inadequate during the feeding interactions, children may learn to use food as a consolation instrument (Faith, Scanlon, Birch, Francis, & Sherry, 2004). Similarly, directive/controlling feeding attitudes of the parents are associated with lower self-regulation in eating and higher weight status among children (Veugelers & Fitzgerald, 2005). Along the same line, parents who highly control their children's food intake, lead them to pay attention to external rather than internal cues in order to regulate the amount of food, which results in lack of self-regulation and greater eating in the absence of hunger (Hughes et al., 2011). Thus, by affecting maternal sensitivity, the maternal inability to regulate emotion likely plays a key role in the overeating behaviors of the child, and presumably represents an important risk factor for overweight and obesity in developmental age (Farrow & Blissett, 2006).

### 1.2. Aim of the study

The link between maternal emotion regulation and early eating patterns finds some support in the literature. However, despite the growing body of research related to this topic and the increasing number of researchers investigating the emotional processes underlying the overweight risk, there is still a lack of longitudinal data in this area. To overcome this lack of empirical data, the current study examined the impact of overweight and maternal emotion dysregulation on the quality of the early feeding interactions. Specifically, we aimed to evaluate the extent to which the quality of emotion regulation strategies in overweight pregnant women, as well as maternal overweight itself, would predict the subsequent dysfunctional feeding interactions with their babies.

## 2. Method

### 2.1. Procedure

Prospective participants were contacted at the Isola Tiberina, Fatebenefratelli hospital, in Rome. After the approval from the hospital's Institutional Review Board was received, all pregnant women who were referred for assistance to the Department of Obstetrics and Gynecology were informed by their gynecologist about the possibility to volunteer for the study. Women willing to participate were given a consent form and a subject's bill of rights. Confidentiality was also reviewed. Though no monetary compensation was offered in exchange for participation, at the end of the study participants received a DVD with the video of their feeding interactions.

During the beginning of the third trimester (28–40 gestational weeks), we conducted the first screening related to the pre-pregnancy BMI. Additional medical and bio-psycho-social information was also collected by a gynecologist and a psychologist, so as to ascertain eligibility. Participants were then assigned to a group based on their BMI: the overweight group was made up of women with a pre-pregnancy BMI between 25 and 30, while the non-overweight group was made up of women with a pre-pregnancy BMI between 20 and 25.

Inclusion criteria required that the participants be (a) primiparous women with full-term singleton gestations, (b) not experiencing chronic diabetes or hypertension, (c) married or cohabiting, (d) in absence of any full-blown psychological diagnosis, and (e) between 28 and 38 years old. Women delivering preterm or post term were also excluded, in order to avoid confounds related to stressful reactions to a different medical condition. As a result of these criteria, this investigation generally included healthy women.

### 2.2. Research design

A quasi-experimental, longitudinal research design, including two independent groups and two research steps<sup>1</sup>, was used. As noted above, the two groups were composed of overweight vs. non-overweight pregnant women. The first step of the research occurred during the third trimester of pregnancy, and aimed at assessing maternal emotion regulation during pregnancy. The second step occurred at 7-months of age of the baby, and aimed at assessing the mother–baby mealtime interactions. The choice of 7 months was based on the fact that babies typically begin to eat solid foods and to more actively participate in the feeding interactions at that age. Observing the feeding interactions at 7 months, thus, allowed for assessing the contribution of both partners, instead of only focusing on the behavior of the mother.

### 2.3. Participants

The entire sample was collected at the Obstetrics and Gynecology Department of Fatebenefratelli Isola Tiberina Hospital in Rome. At step 1, the sample was comprised of 65 Italian women, 33 of whom were overweight and 32 non-overweight. The mean age was approximately 35 years, and nearly half of the sample had a bachelor's degree or a higher level of education. The two groups did not significantly differ in terms of age, education, and gender of the baby. However, in line with other studies in the field (Veugelers & Fitzgerald, 2005), education did approach significance when considering an alpha value of .10. A more detailed description of the sample available at step 1 is presented in Table 1.

Of the 65 women included in the first step of the research, 12 discontinued their participation after the first step, so the second step of the research only included 53 dyads. Age, education, employment position and gender of the baby did not account for attrition rates. However, it should be pointed out that two-thirds of the women who discontinued their participation (i.e., 8 out of 12) were in the overweight group.

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