



What are mothers doing while bottle-feeding their infants? Exploring the prevalence of maternal distraction during bottle-feeding interactions



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ABSTRACT

The purpose of this study was to describe the extent to which mothers engage in distracting activities during infant feeding. Mothers reported engaging in other activities during 52% of feedings; television watching was the most prevalent activity reported. Further research on the impact of distraction on feeding outcomes is needed.

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Rapid weight gain during infancy is a significant postnatal predictor of later obesity [1] and several other later-life metabolic disorders [2–5]. Promotion of maternal responsiveness during feeding interactions, or feeding practices that are developmentally appropriate and in response to infant hunger and fullness cues, has recently been recognized as important for reducing the risk of over-feeding and rapid weight gain in infancy [6]. However, few studies have used objective measures of maternal responsiveness [7] or have explored why some mothers may be more responsive than others [8]. Thus, our current understanding of how to promote responsive feeding practices during infant–feeding interactions is lacking.

Several hypotheses exist for why a mother would feed in a way that is not responsive to an infant's cues. For example, previous researchers have hypothesized that mothers may mistrust infants' abilities to self-regulate intake, lack awareness of appropriate feeding practices, or use food for purposes other than fulfilling nutritional needs (e.g., to soothe) [9–11]. However, given the ubiquity of technological and other distractors in today's society, it is also possible that caregivers engage in other activities during feeding interactions, and these activities distract mothers from attending to their infants' cues.

The potential impact of environmental stimuli on eating behaviors has been a focus of research aimed at understanding causes of overeating in adult samples. This research has shown that “mindless eating,” or

eating while distracted by stimuli such as television (TV) or mobile devices (MDs) [12], leads to overeating by increasing tendencies to eat in response to salient contextual cues, such as the amount of food on the plate, and lowering awareness of feelings of hunger and satiation [13–15]. To our knowledge, only a few studies have explored the analogous concept of “mindless feeding,” or the possible tendency of mothers to attend to environmental stimuli in lieu of their children during feeding interactions [16–18]. In a recent laboratory-based study, we found that almost 30% of bottle-feeding mothers were distracted (e.g., spontaneously used a MD) while feeding their infants and these mothers showed significantly lower sensitivity to their infants' cues compared to mothers who were not distracted. Additionally, infants of distracted mothers who possessed certain temperamental characteristics, (e.g., lower self-regulatory capacity and lower surgency) consumed more formula than infants with similar temperaments whose mothers were not distracted [16]. These results suggest that distracted feeding is associated with lower levels of responsive feeding and may place certain infants at risk for overfeeding.

Given that our preliminary findings occurred within a laboratory-based setting, documenting distracted feeding in free-living settings is a logical starting point for gaining insight into the prevalence of this behavior during typical feeding interactions and the possible need for targeted intervention programs. Therefore, the objectives of the present study were three-fold: 1) to use feeding records to determine the frequency of maternal distraction during bottle-feeding; 2) to explore possible associations between distracted feeding, mothers' reports of infant intake, and infant characteristics (e.g., age and temperament); and 3) to

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examine whether characteristics of mothers (e.g., parity, age) or infants (e.g., sex, age, weight status, temperament) are associated with mothers' tendencies toward distracted feeding.

1. Methods

1.1. Participants

Mothers with 0- to 6-month-old, formula-feeding infants who participated in previous studies between September 2011 and February 2014 [16,19] ($n = 41$) were asked to keep a diary of their infants' feeding patterns for 1–6 days (total number of records = 209; total number of recorded feedings = 1181). Eligible infants were between 0- and 6-months of age, predominantly formula-fed (>80% of feeds), and not yet introduced to solid foods. Eligible mothers were between 18 and 40 years of age, and did not have gestational diabetes or any complications during pregnancy and/or birth that may have resulted in their infants having problems feeding. All participants were recruited through fliers posted in Women, Infant & Children (WIC) offices, libraries, coffee shops, and pediatric offices around Philadelphia, as well as through an advertisement in a local parenting magazine. All study procedures were approved by the Office of Regulatory Affairs at Drexel University, and informed consent was obtained from each mother at study entry.

1.2. Procedures

Mothers received bottle-feeding records through the mail. They were instructed to record the timing, duration, and amount of each feeding, but were also asked to indicate what else, if anything, they were doing while feeding their infants. Records were collected when mothers and infants visited our laboratory several days later, at which time mothers also completed a demographic questionnaire and the Infant Behavior Questionnaire-Revised Very Short Form (IBQ-R), which assesses infants' levels of surgency/extraversion, orienting/regulation capacity, and negative affect [20,21]. Infants' weight and length and mothers' weight and height measurements were also collected and recorded in triplicate. Infant anthropometric data was later normalized to z-scores using the World Health Organization (WHO) Anthro software version 3.0.1 (<http://who.int/childgrowth/en/>); age- and sex-specific percentiles were calculated based on these z-scores.

1.3. Data analysis

Mothers' responses to the question of what else, if anything, they were doing while feeding their infants were sorted into thematic categories using constant comparison within the framework of grounded theory [22]. Two coders (RBC, AKV) independently coded all records using this approach. Results were then reviewed and compared for validity and any discrepancies in theme identification or coding were discussed. Themes were used to classify feedings into two categories: 1) mother was distracted (e.g., watching TV, using a computer, talking to someone other than the infant) versus 2) mother was not distracted (e.g., nothing was specified, interacting with the infant) (Table 1). Given that previous research with adult samples has focused on technological distractors [12], we also further classified the distractions into technological (e.g., watching TV, using a computer or MD) versus not (e.g., reading, doing housework). We then determined for each mother the percentage of feedings during which a distraction was reported and further classified mothers as: 1) never distracted versus 2) distracted during one or more feedings. Similarly, we determined the percentage of feedings during which a technological distractor was reported and also classified mothers as: 1) never distracted by technology versus 2) distracted by technology during one or more feedings.

Descriptive statistics were then calculated to summarize sample demographics and mothers' frequency of different activities and distracted versus not distracted feeding (SPSS version 20, Chicago, IL). Repeated

Table 1

Percentages of feedings where mothers reported distractions versus no distractions while bottle-feeding their infants.

Activity reported	Percent of feedings	Number of feedings
Distractions reported		
Watching television	29%	348
Laying down or sleeping	8%	94
Talking on the phone or to another adult	4%	45
Doing housework	3%	31
Traveling	2%	22
Reading	2%	21
Using a mobile device	2%	21
Listening to music	1%	14
On the computer	1%	13
Eating	1%	10
No distractions reported		
Nothing specified	42%	495
Interacting with baby	6%	67

measures analysis of covariance (ANCOVA) was used to compare mothers' reports of infants' intakes when distractions were versus were not reported and to assess possible interactions between distraction and infant age or temperament subscales (i.e., surgency/extraversion, orienting/regulation capacity, negative affect); where applicable, infant age and time since last feeding were included as covariates. Fisher's exact test and analysis of variance (ANOVA) were used to explore possible associations between maternal distraction and characteristics of mothers (parity, age, race/ethnicity, education, income, or weight status) and infants (sex, birth weight-for-length z-score [WLZ], WLZ at study entry, change in WLZ between birth and study entry, orienting/regulation capacity, negative affect, and surgency/extraversion). Feedings where the mother indicated someone else was feeding the infant were excluded from analysis. A significance level of $P \leq .05$ was used to indicate significant differences.

2. Results

2.1. Sample characteristics

Infants were 14.4 ± 7.1 weeks of age (range = 1.6–25.9 weeks) and 59% ($n = 24$) were girls. Average WLZ at birth was -0.1 ± 1.5 (range = -3.1 – 3.0), and at study entry was 0.8 ± 1.0 (range = -2.2 – 2.7). Mothers were 28.0 ± 7.0 years old (range = 18.0–41.3 years). Seventy-eight percent ($n = 32$) of mothers were overweight or obese ($BMI \geq 25$) and 51.1% ($n = 21$) were obese ($BMI \geq 30$). The majority of mothers were black (70.7%; $n = 29$); 22.0% were white and 7.3% were Hispanic. Additionally, 76.9% ($n = 30$) reported a family income < \$35,000 per year and 92.5% participated in federal assistance programs.

Table 1 presents results of the thematic analysis of mothers' feeding records. For approximately half of the feedings (52%), mothers did a variety of additional activities, including watching TV, laying down or sleeping, using a phone, doing housework (e.g., cooking dinner or cleaning), reading, using a mobile device, traveling (e.g., the baby was in a stroller or car seat), listening to music, using the computer, and eating. During almost one-third (32.4%) of feedings, mothers reported using technological distractors. For the remaining 48% of feedings, mothers reported interacting with their infants or that they did not do anything else during the feeding.

The proportions of mothers who engaged in each activity during one or more of their recorded feedings were calculated (note that the percentages that follow are not mutually exclusive). Seventy-eight percent ($n = 32$) of mothers reported watching TV during one or more of their recorded feedings. Thirty-seven percent ($n = 15$) of mothers reported laying down or sleeping. Lower percentages of mothers (less than one-third) reported the remaining activity themes (i.e., doing

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