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Factors Associated with Infant Feeding Difficulties in the Very Preterm Infant

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Abstract

Aim—To investigate early medical and family factors associated with later feeding risk in preterm infants.

Methods—For this longitudinal study, we enrolled 136 infants born ≤30 weeks gestation. Medical and social background factors were assessed at term equivalent age. Infants underwent magnetic resonance imaging, neurobehavioral evaluation, and feeding assessment. Parent involvement in the neonatal intensive care unit was tracked, and maternal mental health was assessed at discharge. At age two years, feeding outcome was assessed using the Eating Subscale of the Infant-Toddler Social Emotional Assessment (n=80). Associations between feeding problems at age two and 1) early medical factors, 2) neurobehavioral functioning and feeding at term equivalent age, 3) cerebral structure, and 4) maternal mental health were investigated using regression.

Results—Eighteen (23%) children had feeding problems at age two years. Feeding problems were associated with early hypotonia ($p=0.03$; $\beta=0.29$) and lower socioeconomic status ($p=0.046$; $\beta=-0.22$). No associations were observed between early medical factors, early feeding performance, cerebral structure alterations or maternal well-being and feeding outcome.

Conclusion—Early hypotonia may disrupt the development of oral-motor skills. Hypotonia and poor feeding also may share a common etiology. Associations with lower socioeconomic status highlight the influence of family background factors in feeding problems in the preterm infant.

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Keywords

feeding; hypotonia; NICU; outcome; preterm; socioeconomic status

INTRODUCTION

Feeding problems are recognized as a challenging issue faced by many preterm infants during infancy and early childhood. While in the neonatal intensive care unit (NICU), preterm infants often experience high rates of cerebral abnormalities and physiological immaturity, resulting in neurobehavioral dysfunction (1). This neurobehavioral dysfunction can result in difficulties in achieving the essential skills needed for successful oral feeding, including state regulation, motor organization, rhythmical sucking, and the ability to coordinate a suck-swallow-breath pattern (2–4). The invasive medical complications associated with preterm birth can further compromise feeding behavior by delaying the initiation and advancement to full oral feeds (5–7), decreasing opportunities for positive oral experiences, and altering feeding experiences for very preterm infants (8–10). Finally, delays in the attainment of full oral feeds can result in psychological distress amongst mothers, altering the mother-infant relationship (2).

While early medical, environmental, and parental factors have been identified as causes of feeding problems in preterm infants (2, 7, 8, 11, 12), only a few studies have examined the neonatal factors associated with feeding outcome in early childhood (9, 10). These studies found associations with prolonged days on nasogastric/orogastric (NG/OG) feeds and longer periods of intubation and poor feeding outcome in preterm infants. Further, some studies have found high rates of poor feeding outcome in preterm infants with cerebellar injury (13) and full term infants with basal ganglia injury (14). However, there is a paucity of research investigating specific regions of the brain that may be related to feeding outcome in the preterm infant.

The aim of the present study was to investigate the relationship between feeding problems at age two years corrected age and 1) NICU medical and environmental factors, 2) neurobehavioral functioning and feeding at term equivalent age, 3) cerebral structure on magnetic resonance imaging (MRI) at term equivalent age, and 4) maternal mental health and socio-demographics at NICU discharge. We hypothesized that infants with more medical complications, specifically those with lower gestational age and with longer periods of oral intubation, and those born to mothers subject to high levels of stress and anxiety at discharge would have more feeding problems at age two years.

METHODS

This was a longitudinal study investigating associations between early factors in the NICU and poor feeding outcome at age two years. It was approved by the Human Research Protection Office at the study site, and parents signed informed consent. Consecutive inborn admissions to a level III NICU were recruited by the third day of life between 2007–2010. Inclusion criteria were birth at ≤30 weeks gestation and no documented congenital anomaly. Medical factors and interventions in the NICU were collected from the medical record.

Infants underwent feeding evaluation, neurobehavioral testing, and MRI at term equivalent age. Parent visitation and infant holding were tracked across the NICU stay. Maternal mental health was assessed at discharge. Infants returned at age two years, and feeding behaviors were assessed using the Eating Subscale of the Infant-Toddler Social Emotional Assessment (ITSEA).

Feeding outcome (2 years)

The extent of infant feeding problems was assessed using the Eating Subscale of the parentreported Infant-Toddler Social Emotional Assessment (ITSEA). This subscale consists of nine items assessing a range of feeding difficulties, as shown in Table 1. Parents rated the frequency with which their child engaged in each feeding behavior on a scale ranging from 0 (never/rarely) to 2 (often). A total mean score was computed. Using the ITSEA criteria, children were defined as having a feeding problem if their mean score exceeded 0.95 for girls and 0.97 for boys ($\geq 10^{th}$ percentile of the normative sample). A Cronbach's α=0.82 was computed for the Eating Subscale, demonstrating high internal consistency. Correlations between the Eating Subscale and other subscales that contribute to the overall ITSEA Dysregulation domain score were as follows: Negative Emotion (r=0.27), Sleep (r=0.15), Sensory Sensitivity (r=0.54), and Dysregulation domain score (r=0.68). In order to identify early neonatal and family background predictors of feeding problems at age two years, a wide range of measures were examined and investigated for associations with raw scores on the ITSEA Eating Subscale. Key measures found to be important and included in this analysis are described below.

Early medical and environmental factors

Baseline infant factors that were collected included: estimated gestational age (EGA) at birth, birth weight, race (Caucasian or non-Caucasian), multiple or singleton birth, gender, and prenatal illicit drug exposure. Medical factors collected throughout the length of stay in the NICU included: days of total parenteral nutrition (TPN), days of NG/OG tube feeding, days of oral endotracheal intubation, days of continuous positive airway pressure (CPAP), patent ductus arteriosus (requiring treatment with Indomethacin or surgical ligation), necrotizing enterocolitis (NEC; all stages), confirmed sepsis, and any breast milk feeding at discharge. For days on oral intubation, days on TPN, and days on CPAP, a dichotomous variable was calculated by taking those above the upper quartile and those below the upper quartile.

Parent presence and holding

Nursing staff documented each time the primary caregiver visited and whether the infant was held in arms or held skin-to-skin during each 12-hour shift. Average days per week visited, average days held in arms per week, and average days held skin-to-skin per week were calculated over the length of stay. The day of life on which the infant was first held was also documented. Parent visitation and holding and days to first hold were explored for associations with feeding outcome at age two years.

Feeding and neurobehavioral functioning

Feeding ability was assessed at term equivalent age (between 37 to 41 weeks postmenstrual age) using the Neonatal Oral-Motor Assessment scale (NOMAS). The NOMAS is a 28-item assessment, which categorizes neonatal feeding as normal, disorganized, or dysfunctional. The NOMAS has acceptable convergent validity for infants 32 to 35 weeks postmenstrual age (Spearman r=0.51–0.69) (15) and varying interrater reliability (κ= −0.43 and 0.62) and intrarater reliability (κ=0.33 to 1.00) (16). Neurobehavioral functioning was assessed at term using the NICU Network Neurobehavioral Scale (NNNS). The NNNS is a 115-item neurobehavioral assessment, which yields 13 summary scores: habituation, tolerance of handling, quality of movement, self-regulation, non-optimal reflexes, stress signs, arousal, hypertonia, hypotonia, asymmetry, excitability, lethargy, and orientation. The NNNS has been shown to be predictive of medical and behavioral outcomes in preterm infants (17). The NOMAS and NNNS assessments were conducted by a single occupational therapist that was trained and certified in both evaluation methods. Postmenstrual age at time of evaluation was controlled for when investigating associations with NNNS summary scores.

Cerebral structure and injury

MRI was acquired at term equivalent age using a 3-T TIM Trio system (Siemens, Erlangen). MRI scanning included magnetization-prepared rapid gradient echo T1-weighted images (TR/TE 1500/3 ms, voxel size 1×0.7×1 mm^3) and turbo spin echo T2-weighted images (TR/TE 8600/160 ms, voxel size 1×1×1 mm^3, echo train length 17). Diffusion imaging was obtained using a single-shot EPI sequence (TR/TE 13300/1266, 48 *b* directions with amplitudes ranging up to 1200 s/mm^2, voxel size 1.2×1.2×1.2 mm^3). MRI was assessed using the following:

1. Qualitative MRI findings were combined with routine cranial ultrasound. Cerebral injury was defined as the presence of grade III–IV intraventricular hemorrhage, cystic periventricular leukomalacia or cerebellar hemorrhage. A standardized scoring evaluation of brain growth and development was also applied (18).
2. Brain metrics were conducted for bifrontal diameter, biparietal diameter, bone-biparietal diameter ratio, interhemispheric distance, and transcerebellar diameter using methodologies described previously (19).
3. Diffusion tensor imaging (DTI) measures were obtained from MRI bilaterally in the following regions: anterior limb of the internal capsule, posterior limb of the internal capsule, optic radiation, frontal lobe, cingulum bundle, centrum semiovale, and the corpus callosum. DTI was interpreted by a trained evaluator. Postmenstrual age at time of scan was controlled for when investigating associations with DTI.
4. Volumetry was conducted with Advanced Normalization Tools software (ANTS), a multi-platform automated tissue segmentation software package, using methodologies previously described (20, 21). Images were registered to a neonatal atlas, and tissue types were delineated using tissue probability maps (22). The ANTs segmented MRI volumes were then manually corrected using ITK-Snap software. Volumes were obtained on gray matter, white matter, deep nuclear gray

matter, and cerebrospinal fluid. Postmenstrual age at time of scan was controlled for when investigating associations with volumetry.

Cerebral injury, in addition to the standardized scoring of brain growth and development, brain metrics, DTI, and brain volumes were investigated for associations with feeding outcome.

Maternal mental health and socio-demographics

Maternal mental health was assessed at hospital discharge using standardized assessments embedded within a written questionnaire that contained the State-Trait Anxiety Inventory (scores range from 20 to 80), Edinburgh Postnatal Depression Scale (scores range from 0 to 30), Parenting Stress Index Life Stress Score (scores range from 1 to 27), and Coping Inventory for Stressful Situations (scores range from 16 to 18). Higher scores for these assessments indicate greater anxiety, depression, stress, and coping. Maternal factors collected from these assessments included: state and trait anxiety, depression, parental confidence and number of stressful events experienced, emotion-oriented and avoidance-coping strategies. Maternal age, marital status, and insurance type (Medicaid versus private insurance) were also collected. Insurance type was used as a proxy for socioeconomic status (SES).

Statistical Analysis

All independent variables, including 1) early medical factors and interventions, 2) parent presence and holding, 3) feeding performance and neurobehavioral functioning at term, 4) cerebral structure and injury at term (qualitative brain injury scores, brain metrics, DTI, volumetry), and 5) maternal mental health and socio-demographic factors at discharge were investigated for associations with the ITSEA Eating Subscale score using simple linear regression models. All analyses were performed using IBM SPSS (version 20) with $\alpha<0.05$ (two tailed test).

Using oral intubation as the primary independent variable, a power analysis was conducted. With our sample, there was 82% power to detect differences in feeding outcome when the true difference in ITSEA Eating Subscale score was 0.33, with a two tailed t-test and $\alpha=0.05$.

RESULTS

There were 174 eligible infants during the study recruitment period. Of these, 154 were approached and 18 declined. One hundred and thirty-six infants were enrolled (78% of those eligible to participate). There were no significant differences in EGA at birth among the study population and those who were eligible to participate. Of the 136 infants enrolled, seven withdrew, one transferred to another hospital, and one was withdrawn following diagnosis of a congenital anomaly. Of the remaining 127 infants, 20 infants died prior to NICU discharge. Following discharge, an additional two infants died and one infant withdrew, leaving a final sample of 104 infants in the cohort. Seventy-seven percent (n=80) of those remaining in the cohort at age two years completed the ITSEA. No differences were found between those who did and did not have complete ITSEA data at age two years.

Table 1 describes the feeding behaviors of the study infants as reported by parents on the nine items of the ITSEA Eating Subscale. The mean (SD) total ITSEA Eating Subscale score for the group was 0.61 (0.45). Eighteen (23%) of infants met criteria for a feeding problem at age two years with a mean (SD) score of 1.28 (0.23) and range of 1.00–1.67. One infant (1%) within this group was identified as having a gastrostomy tube at two years. Further examination of the extent of overlap between feeding and the other self-regulatory problems reported by parents on the ITSEA revealed the following: 5/18 (28%) had negative emotions, 3/18 (17%) had sleep difficulties, and 4/18 (22%) had sensory sensitivities on the ITSEA. Fifty five percent (n=44) of the cohort were described by their parents as being a "good eater".

Table 2 examines the neonatal factors associated with feeding outcome, and Table 3 describes maternal and socio-demographic factors associated with feeding outcome. Poorer ITSEA Eating Subscale scores were associated with hypotonia at term ($p=0.03$; $\beta=0.29$) and lower SES ($p=0.046$; $\beta=-0.22$). No other associations were found between ITSEA Eating Subscale scores and baseline infant factors (EGA, birth weight, race, multiple birth, gender, and prenatal illicit drug exposure), early medical factors (length of TPN, days of NG/OG tube feeding, length of oral intubation, length of CPAP, patent ductus arteriosus, NEC, confirmed sepsis, and any breast milk feeding at discharge), parent presence and holding, feeding performance at term equivalent age (NOMAS), other summary scores for neurobehavior at term equivalent age on the NNNS, and cerebral injury and structure (qualitative brain injury scores, brain metrics, DTI, volumetry). As shown, the only social background and family factor found to correlate with later feeding outcome was family SES. Maternal mental health (anxiety, depression, coping, and stress) at discharge was not associated with feeding outcome at age two years.

Separate analyses were conducted on smaller (23–27 EGA) infants and larger (28–30 EGA) infants, and the findings remained unchanged. In addition, nonparametric analysis was undertaken to investigate associations between days of TPN, oral intubation, and CPAP, and there were no associations with feeding outcome.

DISCUSSION

The findings from our study suggest that almost one in five very preterm infants is subject to feeding problems at age two years, which is double the rate in healthy full term infants (23). Infants characterized by hypotonia in the NICU and infants whose parents were from lower SES backgrounds were at higher risk of feeding problems at age two years.

No early medical factors in the NICU were found to be associated with feeding problems at age two years. Prior studies have suggested associations between medical conditions and interventions in the NICU, including days of NG tube feeding (9) and the need for prolonged respiratory support (8, 10), with later feeding difficulties. It has been suggested that such interventions expose infants to aversive oral stimuli and delay the oral feeding process (9, 10). However, findings from the current study did not support this. The lack of association between respiratory supports, such as CPAP and oral intubation, may be a result of changing trends in neonatal care, in which infants are on respiratory support for fewer

days than in the past. It could also indicate that factors, other than those related to medical complications and interventions, play a larger role in adverse feeding behaviors.

Hypotonia on neurobehavioral assessment at term equivalent age was found to be a risk factor for later feeding problems at age two years. While there is a lack of research on hypotonia in preterm infants and its impact on feeding, research has shown the negative impact of hypotonia among infants with genetic syndromes, with reports of latching and sucking difficulties in infancy and challenges in managing solid foods in childhood (24, 25). Hypotonia can impair the development of the motor skills needed for successful oral feeding (26), which can make it difficult to transition through the stages of feeding development. This can result in a disruption to the feeding process with subsequent feeding problems in childhood. Another potential explanation for the association between hypotonia and poor feeding behavior is the existence of a common etiology for both. For example, cerebellar (13) and basal ganglia (14) injury in prior studies have been associated with both hypotonia and poor feeding. While qualitative evaluation of cerebral injury did not appear to be a major mediator for adverse feeding outcome in the current study, such imaging evaluations may not have detected functional disruption in cerebral connectivity in these regions, which may not have influenced feeding behaviors until early childhood. Functional connectivity and diffusion tractography studies may inform such associations in future studies.

No associations between feeding performance at term equivalent age and feeding outcome at age two years were observed. This is in contrast to previous research identifying associations between disorganized and dysfunctional feeding patterns on the NOMAS between 36–40 weeks postmenstrual age and feeding problems at 6 and 12 months of age (27). However, this study differed from the current study in that infants were assessed during significant feeding transitions of weaning and advancing food textures, whereas these major transitions had already taken place when assessing feeding outcome in our study. Further, NOMAS assessment was conducted when oral feedings had just been initiated but prior to the achievement of full oral feedings between 37–41 weeks gestation. It is possible that an assessment of feeding performance made when an infant is at or beyond term age, and after all medical complications have resolved, provides a better indication of future feeding performance. It is also possible that the lack of associations is related to the influence of both biological and environmental influences during the first two years of life (28). Due to associations with SES, our findings suggest that the home environment after discharge may have a stronger impact on feeding outcome at two years than feeding performance at NICU discharge.

Parents of lower SES were more likely to report feeding problems in their child at age two years. There has been no published research that has investigated associations between low SES with feeding problems in premature infants. Successful feeding is dependent upon responsive parenting feeding styles, which include having a structured feeding environment, attending to hunger cues, and responding in an emotionally supportive manner (29). Parents of lower SES are likely to be subject to higher levels of psychosocial stress and have fewer economic and social resources, potentially compromising their ability to provide their child with high quality nutrition, food variety, daily structure and routines, as well as therapeutic services (30). These home challenges may interact with other factors related to preterm

birth, resulting in the child engaging in attention seeking and problematic feeding behaviors (29). Although this study found associations between low SES and feeding problems at age two years, it is difficult to determine what aspect of the environment might be influencing feeding problems, as this was not investigated as part of this study. These findings warrant further investigation.

There were limitations to this study. First, although the ITSEA has been identified as a valid and reliable tool, the Eating Subscale has never been used in isolation. It is meant to be a measure of feeding problems related to dysregulation and consists of nine feeding questions. It is also a parent report measure, and most questions tap into behavioral aspects of feeding. However, there are few tools available to evaluate feeding problems at this age. With only 55% of parents reporting that their child is a good eater, tools that can better differentiate alterations in feeding are needed. Second, this study relied on multiple comparisons to determine which factors were associated with feeding problems, which increases the risk of Type I error. Due to the exploratory nature of this study, Bonferroni correction was not used.

CONCLUSION

We found that feeding problems in childhood are associated with hypotonia at term equivalent age and having family socioeconomic adversity. Early hypotonia may limit adaptive functioning and disrupt the development of oral-motor skills. Findings from this study suggest that factors in the home environment, rather than early medical factors, are important for optimal feeding outcome in children born prematurely. Understanding these associations can assist in the early identification of at-risk infants and enable activation of early intervention services. Future research is necessary to obtain a better understanding of what aspects of the home environment directly influence feeding problems in premature infants in order to develop targeted interventions.

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Abbreviations

CPAP	continuous positive airway pressure
DTI	diffusion tensor imaging
EGA	estimated gestational age

ITSEA	Infant-Toddler Social Emotional Assessment
MRI	magnetic resonance imaging
NEC	necrotizing enterocolitis
NG	nasogastric
NICU	neonatal intensive care unit
NNNS	NICU Network Neurobehavioral Scale
NOMAS	Neonatal Oral Motor Assessment Scale
OG	orogastric
SES	socioeconomic status
TPN	total parenteral nutrition

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Key notes

- In this study of 80 preterm infants, 23% (n=18) had feeding problems at age 2 years, and 55% (n=44) were described by their parents as being a ‘good eater’.
- Poor feeding outcome was not associated with early medical factors, feeding performance at term equivalent age, cerebral structural alterations, or maternal mental health.
- Feeding outcome was associated with early hypotonia and socioeconomic status.

Table 1

Infant-Toddler Social Emotional Assessment Eating Subscale items and frequency of responses.

Infant-Toddler Social Emotional Eating Subscale items	Never/rarely n (%)	Sometimes n (%)	Often n (%)
1) Gags and chokes on food?	53 (66%)	22 (28%)	5 (6%)
2) Refuses to eat?	47 (59%)	24 (30%)	9 (11%)
3) Refuses to eat foods that require chewing?	60 (75%)	13 (16%)	7 (9%)
4) Spits out food?	21 (26%)	41 (51%)	18 (23%)
5) Accepts foods right away?	19 (24%)	37 (46%)	24 (30%)
6) Good eater?	8 (10%)	28 (35%)	44 (55%)
7) Picky eater?	33 (41%)	25 (31%)	22 (28%)
8) Refuses to eat certain foods for two days or more?	47 (59%)	21 (26%)	12 (15%)
9) Holds food in cheeks?	59 (74%)	13 (16%)	8 (10%)
	n (%)		
Feeding problems (n=80)	18 (23%)		

Table 2

Neonatal Factors Associated with Feeding Problems.

Variable	Total group (n=80) M (SD) or (n) % or Median (IQ range)	No feeding problems (n=62) M (SD) or n (%) or Median (IQ range)	Feeding problems (n=18) M (SD) or n (%) or Median (IQ range)	*p*[*]
EGA[†] at birth (weeks)	26.6 (1.9)	26.61(1.9)	26.7 (1.7)	0.68
Birth weight (g)	937 (254)	956 (257)	872 (239)	0.88
Female gender	45 (56%)	33 (53%)	12 (67%)	0.18
Caucasian	45 (56%)	36 (58%)	9 (50%)	0.96
Multiple births	33 (41%)	24 (39%)	9 (50%)	0.12
Prenatal drug exposure	4 (5%)	2 (3%)	2 (11%)	0.25
Days of ventilation	2 (1–18)	3 (1–14)	2 (1–23)	0.87
Days on CPAP[‡]	4 (1–11)	3 (1–10)	7 (3–20)	0.75
Days on TPN[§]	18 (11–31)	17 (11–32)	20 (14–29)	0.06
Days on NG/OG tube[//]	72 (27)	70 (23)	81 (39)	0.50
Patent ductus arteriosus	43 (54%)	32 (52%)	11 (61%)	0.25
Necrotizing enterocolitis	5 (6%)	4 (7%)	1 (6%)	0.87
Confirmed Sepsis	26 (33%)	19 (31%)	7 (39%)	0.40
Breast milk at discharge	29 (36%)	23 (37%)	6 (33%)	0.22
Average days visited[¶]	5.4 (1.4)	5.4 (1.3)	5.1 (1.6)	0.07
Average days cuddled[¶]	2.8 (1.7)	2.9 (1.8)	2.3 (1.1)	0.29
Average days skin-to-skin[¶]	0.78 (0.95)	0.77 (0.98)	0.85 (0.84)	0.86
Day of life of first hold	8.7 (8.6)	8.5 (8.9)	9.2 (8.0)	0.27
Cerebral injury (n=76)	15 (20%)	14 (24%)	1 (6%)	0.52
Abnormal neonatal feeding (n=52)[**]	22 (42%)	17 (42%)	5 (46%)	0.67
NNNS (n=59)				
Habituation	7.2 (2.1)	7.3 (2.1)	7.0 (2.2)	0.49
Orientation	3.3 (1.2)	3.3 (1.2)	3.3 (1.4)	0.82
Handling	0.68 (0.16)	0.68 (0.17)	0.68 (0.12)	0.81
Quality of movement	3.54 (0.77)	3.48 (0.70)	3.75 (1.01)	0.61

Variable	Total group (n=80) M (SD) or (n) % or Median (IQ range)	No feeding problems (n=62) M (SD) or n (%) or Median (IQ range)	Feeding problems (n=18) M (SD) or n (%) or Median (IQ range)	*p**
Self-regulation	4.37 (0.80)	4.38 (0.78)	4.35 (0.89)	0.83
Suboptimal reflexes	6.7 (2.1)	6.7 (2.1)	6.6 (2.3)	0.73
Stress	0.36 (0.12)	0.36 (0.12)	0.35 (0.09)	0.64
Arousal	4.18 (0.96)	4.24 (0.99)	3.93 (0.80)	0.50
Hypertonia	1.75 (1.17)	1.70 (1.20)	1.92 (1.08)	0.87
Hypotonia	**0.69 (0.77)**	**0.57 (0.68)**	**1.17 (0.94)**	**0.03**
Asymmetry	2.0 (2.1)	2.0 (2.2)	2.1 (1.7)	0.84
Excitability	5.6 (2.6)	5.8 (2.6)	4.8 (2.6)	0.57
Lethargy	6.8 (3.1)	6.6 (3.1)	7.7 (3.0)	0.19

*Linear regression investigating associations with Infant-Toddler Social Emotional Assessment Eating Subscale scores, using $\alpha<0.05$;

†Estimated gestational age;

‡Continuous positive airway pressure;

§Total parenteral nutrition;

//Nasogastric/orogastric;

¶Average days throughout length of stay;

**Abnormal feeding was determined by the Neonatal Oral Motor Assessment Scale.

Table 3

Maternal and Socio-demographic Factors Associated with Feeding Problems.

Variable	Total group (n=80) M (SD) or n (%)	No feeding problems (n=62) M (SD) or n (%)	Feeding problems (n=18) M (SD) or n (%)	*p**
Maternal age	28.5 (7.0)	28.7 (7.4)	27.9 (5.6)	0.17
Married parents	33 (41%)	25 (40%)	8 (44%)	0.89
Public insurance (SES)	**29 (36%)**	**18 (29%)**	**11 (61%)**	**0.046**
Depression† (n=69)	13 (19%)	10 (18%)	3 (21%)	0.59
Parental Stress Index (n=71)				
Parental confidence	4.34 (0.96)	4.35 (1.01)	4.29 (0.73)	0.62
Number of stressful life events	2.9 (1.8)	3.1 (1.8)	2.1 (1.5)	0.25
STAI‡(n=70)				
State anxiety	37 (15)	37 (15)	37 (15)	0.83
Trait anxiety	33.6 (8.9)	33.7 (8.9)	33.1 (9.1)	0.86
CISS§(n=66)				
Emotion-oriented coping	32 (11)	32 (10)	32 (13)	0.53
Avoidance-oriented coping	43 (12)	43 (13)	41 (9)	0.84

*Linear regression investigating associations with Infant-Toddler Social Emotional Assessment Eating Subscale scores, using $\alpha<0.05$;

†Depression scores from Edinburgh Postnatal Depression Scale;

‡Stress scores from State-Trait Anxiety Inventory;

§Scores from Coping Inventory for Stressful Situations.