

Breastfeeding Practices and Problems Among Obese Women Compared with Nonobese Women in a Brazilian Hospital

Marina Rico Perez,^{1,i} Lucíola Sant'Anna de Castro,^{2,ii} Yan-Shing Chang,^{3,iii} Adriana Sañudo,^{2,iv} Karla Oliveira Marcacine,^{1,v} Lisa H Amir,^{4,5,vi} Michael G. Ross,^{6,vii} and Kelly Pereira Coca^{1,*,viii}

Abstract

Background: Women who are obese have lower rates of breastfeeding initiation and duration and are less likely to breastfeed exclusively compared with women who are not obese. To develop programs to improve breastfeeding practices among this group of women, we investigated the association between maternal obesity and breastfeeding practices and problems in the first days postpartum.

Methods: We analyzed medical records from postpartum women at a rooming-in maternity ward in State of São Paulo, Brazil, between 2016 and 2018. We included those who had intended to exclusively breastfeed, had given birth to a singleton and were admitted to rooming-in. We analyzed exclusive breastfeeding and non-exclusive breastfeeding each day of hospitalization and the presence of breastfeeding problems, comparing women in the obese category (body mass index [BMI] ≥ 30 kg/m²) to normal and overweight women (≥ 18.6 to ≤ 29.9 kg/m²).

Results: Two hundred and twenty-four postpartum women participated, including 86 women in the obese category. More than 50% of women with obesity reported a breastfeeding problem in the first and second postpartum days ($p=0.026$ and $p=0.017$, respectively) compared with the 41% and 38% nonobese group. Children of obese women were 2.8 times more likely to have poor latch during breastfeeding (95% confidence interval [CI]: 1.29–6.10) compared with the nonobese group on the third day.

Conclusion: Maternal obesity increased the probability of breastfeeding difficulties and nonexclusive breastfeeding at discharge. Professionals need to support breastfeeding techniques in the days immediate after delivery to improve breastfeeding outcomes for mothers with obesity.

Keywords: breastfeeding; maternal obesity; body mass index; early weaning

ⁱEscola Paulista de Enfermagem, Universidade Federal de São Paulo, São Paulo, Brazil.

ⁱⁱDepartment of Preventive Medicine, Escola Paulista de Medicina, Universidade Federal de São Paulo, São Paulo, Brazil.

ⁱⁱⁱFlorence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College London, London, United Kingdom.

^{iv}Judith Lumley Centre, La Trobe University, Victoria, Australia.

^vBreastfeeding Service, Royal Women's Hospital, Victoria, Australia.

^{vi}Obstetrics and Gynecology, Geffen School of Medicine at UCLA, Los Angeles, California, USA.

^{vii}ORCID ID (<https://orcid.org/0000-0003-1703-2749>).

^{viii}ORCID ID (<https://orcid.org/0000-0001-9729-8306>).

ⁱORCID ID (<https://orcid.org/0000-0002-9086-4472>).

ⁱⁱORCID ID (<https://orcid.org/0000-0003-1187-0143>).

ⁱⁱⁱORCID ID (<https://orcid.org/0000-0003-2373-7980>).

^{iv}ORCID ID (<https://orcid.org/0000-0002-2510-1399>).

^vORCID ID (<https://orcid.org/0000-0001-5500-404X>).

^{vi}ORCID ID (<https://orcid.org/0000-0002-3604-852X>).

*Address correspondence to: Kelly Pereira Coca, RNM, IBCLC, PhD, School of Nursing, Universidade Federal de São Paulo, 754 Napoleao de Barros Street, Sao Paulo 04024-002, Sao Paulo, Brazil, E-mail: kcoca@unifesp.br



Introduction

The World Health Organization (WHO) reported that obesity was one of the major public health problems globally, as the worldwide prevalence of obesity nearly tripled between 1975 and 2016.¹ In Brazil, obesity rates have increased among all age groups, in both sexes and at all income levels, although with a greater growth rate in the population with lower schooling.² Among women of reproductive age, obesity rates increased from 12% in 2006 to 21% in 2019 according to the latest Brazilian Health data.²

Despite the benefits and exclusive breastfeeding recommendations of health organizations, only 37% of infants were exclusively breastfed during the first 6 months worldwide,³ including Brazil (38.6%).⁴ Breastfeeding rates are lower in women who are obese compared with women who are not obese. Women with prepregnancy body mass index (BMI) ≥ 30 kg/m² are less likely to intend to exclusively breastfeed compared with normal weight and overweight women (78.8% vs. 95.5% and 96.2%, respectively).⁵ The lower rate of breastfeeding intention is critical because maternal intention to breastfeed is among the strongest factors associated with length of lactation.⁶

Compared with women who are not obese, women who are obese have lower rates of initiation and shorter duration of breastfeeding throughout the first year after delivery, and are less likely to breastfeed exclusively, even with adjustment of confounding variables (e.g., maternal age, parity, type of delivery, smoking, intention to breastfeed,^{7,8} and previous history of delayed lactogenesis).^{9,10} An Australian cohort study reported that women who are obese have nearly one-half the probability to initiate breastfeeding and they are 1.4 times less likely to continue breastfeeding at 6 months.¹¹ Despite the reported lower rates of breastfeeding in obese mothers,¹² encouragement of exclusive breastfeeding (EBF) may improve the rates of EBF at 6 months.¹³ Obese women also have higher chances of earlier formula supplementation, are at increased risk for early weaning,^{5,6,11,14} and early breastfeeding cessation.¹⁵

Several reasons have been proposed to explain the relationship between obesity and the lower rates of breastfeeding, including mechanical issues (breast engorgement, larger amounts of adipose tissue, flattened areolas, and edema) and hormonal factors such as delayed lactogenesis.^{16–18} Obese women are more likely to report problems with milk supply because of their changes in prolactin levels,¹⁹ hypoplasia of the mammary gland and reduced stromal

tissue.²⁰ Other risk factors associated with obesity include delayed early contact as a consequence of cesarean section^{18,21} and poor body image.²² Women who are obese experience both physical and psychological barriers to the initiation and continuation of breastfeeding.^{6,23}

Considering the global trend of increasing obesity in both general and obstetric populations, the benefits of breastfeeding for women and children, and the challenges experienced by puerperal women who are obese, it is of particular importance to provide adequate care to this population to facilitate the initiation maintenance, and exclusivity of breastfeeding.²⁴ Because breastfeeding practices are strongly influenced by maternal feeding intention, we aimed to study women who intended to exclusively breastfeed to investigate the specific problems they encounter in the immediate postpartum period.

Methods

Study design and setting

A retrospective cohort study was conducted with the medical records of women who gave birth between June 2016 and September 2018 in the public maternity unit of a hospital located in the city of São Paulo, Brazil (Sao Paulo hospital). The maternity unit is a referral site for high-risk pregnant women and has an average of 52 births per month, with a total of 1401 births during the study period. The routine of hospital lactation consultants was to assess mother–baby breastfeeding performance at least once a day from birth to hospital discharge (Fig. 1). On the second day after delivery, the nutritionist weighed and measured the height of the women on a calibrated digital scale with a coupled stadiometer. All data were recorded on the mother's and infant's medical records.

Participants

Eligible study criteria included complete medical records from the postpartum women who were attended by the lactation consultant at least once a day during their postpartum hospital stay and had intended to exclusively breastfeed on admission to the postpartum ward. We included births ≥ 34 weeks' gestation, infants ≥ 2000 g, who were clinically stable and were rooming-in. We excluded women who were underweight (BMI < 18.5 kg/m²), had inverted nipple/s, multiple gestations, or hospital stays < 48 hours (Fig. 2).

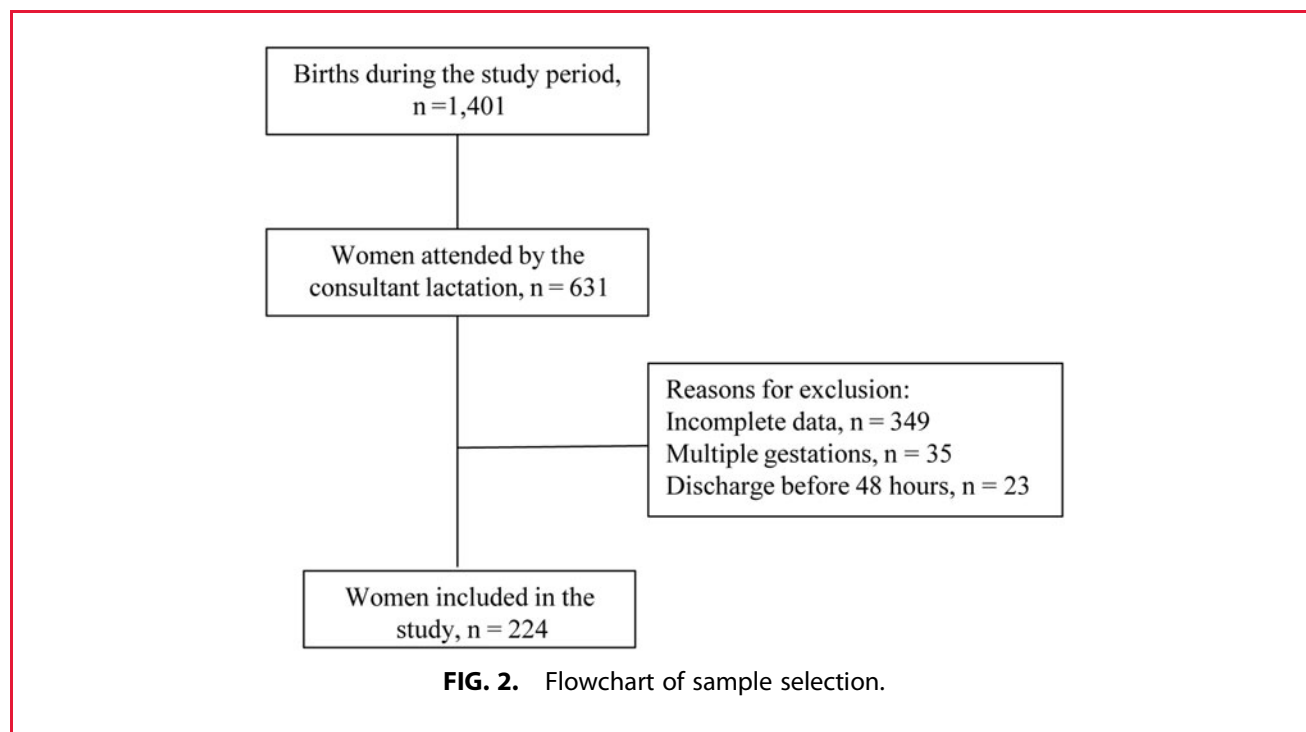


Breastfeeding Assessment in Rooming-in	
Name: _____ Age: _____ Phone: _____	
Bed hospital: _____ Hospital Record: _____	
1 st Day - ___/___/___ Complaints: _____	LATCH score: _____
Mother positioning: () suitable () inappropriate : _____	Child current weight: _____g
Child positioning: () suitable () inappropriate: _____	Child weight loss: _____g / _____%
Latch: () suitable () inappropriate: _____	EBF: () yes () no
Conduct: _____	FA: () yes () no
	Nipple damage – L () R ()
	Score nipple pain L: ___ R: ___
2 nd Day - ___/___/___ complaints: _____	LATCH score: _____
Mother positioning: () suitable () inappropriate : _____	Child current weight: _____g
Child positioning: () suitable () inappropriate: _____	Child weight loss: _____g / _____%
Latch: () suitable () inappropriate: _____	EBF: () yes () no
Conduct: _____	FA: () yes () no
	Nipple damage – L () R ()
	Score nipple pain L: ___ R: ___
3 rd Day - ___/___/___ complaints: _____	LATCH score: _____
Mother positioning: () suitable () inappropriate : _____	Child current weight: _____g
Child positioning: () suitable () inappropriate: _____	Child weight loss: _____g / _____%
Latch: () suitable () inappropriate: _____	EBF: () yes () no
Conduct: _____	FA: () yes () no
	Nipple damage – L () R ()
	Score nipple pain L: ___ R: ___
Discharge date: ___/___/___	
Discharge in Exclusive Breastfeeding: () yes () no – Reason: _____	
Referral to Breastfeeding Centre: ___/___/___	

EBF= Exclusive breastfeeding FA= Formula L= Left R= Right

FIG. 1. Mother–baby breastfeeding assessment form.





Data collection

Data were extracted from maternal and infant medical records by lactation consultants. Maternal sociodemographic characteristics (age, schooling, and had a partner), health conditions (postpartum body weight, height, presence of diabetes, and/or hypertension before or after pregnancy), and obstetric data (parity and type of delivery) were obtained from maternal medical records. From infant's medical records, newborn data (gestational age, birth weight, skin-to-skin contact at birth, and early breastfeeding [breastfeed within the first hour after birth]) were obtained. Maternal medical records also were extracted for clinical examination on breastfeeding (assessment of nipple damage, nipple pain, mother and child positioning, baby's latch, and prescription of formula supplementation by pediatrician at the time of discharge).

Data measures

Participants were classified according to BMI: underweight (BMI <18.5 kg/m²), normal (BMI ≥18.6 and ≤24.9 kg/m²), overweight (BMI ≥25 and ≤29.9 kg/m²), or obese (BMI ≥30 kg/m²)²⁵ based on measures at day 2 postpartum. We compared women with obesity to the combined group of overweight and normal weight women. We considered skin-to-skin contact at birth when it was reported in the medical records that the newborn was placed naked in direct contact

with the mother's breast skin, as soon as s/he was born or shortly thereafter.²⁶ Early breastfeeding was defined as the baby having her/his first suckling within the first hour after birth.

Feeding practices were classified according to the WHO (2009)²⁷: EBF (when the infant received only breast milk), and non-EBF (when the infant received infant formula in at least one feeding) in the previous 24 hours. The mother and child positioning, and baby's latch were analyzed using the Portuguese version²⁸ of the original LATCH Scoring System²⁹ that provides a systematic assessment for latch, audible swallowing, type of nipple, comfort, and hold. The system assigns a numerical score (0, 1, or 2) to these five key components of breastfeeding (maximum 10 points). A higher score indicates better feeding attributes.

We defined breastfeeding problems when the lactation consultant indicated that a mother had one of the following: visual evidence of nipple damage observed by the lactation consultant, nipple pain reported by the women during a breastfeeding observation session, poor mother and child positioning during a breastfeed, or poor latch as assessed by the lactation consultant using the LATCH tool.²⁸

Statistical methods/analysis

Descriptive data are presented as measures of central tendency (mean) and dispersion (standard deviation



[SD] and minimum and maximum values) for quantitative variables, and relative and absolute frequencies for qualitative values. Chi square, Fisher's exact test, and Student's *t*-tests were used to compare the groups.

The variables of outcome (feeding practices, problems related by the mother, nipple damage and pain, mother and child positioning/latch) were analyzed by Generalized Linear Models with panel data using the "xtlogit" (Stata/SE 15.1 for Windows—StataCorp). All models included group effect (obese or nonobese), time (days 1, 2, and 3) and the interaction between group and time. The results are expressed as odds ratio and respective 95% confidence interval (95% CI). In all analysis, a significance level of $p=0.05$ was adopted.

The Research Ethics Committee of the university approved the project under No. 1.814.160/2016, according to the guidelines and norms of the National Health Council Resolution (No. 466/2012).

Results

Two hundred and twenty-four postpartum women were included in the study (Fig. 2). The average age was 31 years (SD=6.4), average education of 11 years (SD=2.3), and 91% of women reported a partner. In this sample, 38.4% of women were obese. Among all women, ~37% had hypertension or diabetes mellitus in pregnancy. Two thirds (67.6%) of women were multiparous and slightly more than half (52.3%) had a vaginal birth. The average gestational age was 38.2 ± 1.4 weeks (range 34–41 weeks) and average birth weight was 3170 g (SD=482). Overall, 60.7% of babies had skin-to-skin contact at birth and 41.6% had early breastfeeding.

Table 1 presents women and baby's characteristics according to maternal BMI (obese or nonobese). There were no statistically significant differences between the groups in age, schooling, reported partner, proportion primiparous, and vaginal delivery. Obese mothers had a higher frequency of diabetes mellitus and/or hypertension when compared with nonobese women ($p<0.001$). There were no statistically significant differences in infant weight, term delivery, skin-to-skin contact at birth, or rates of early breastfeeding.

Table 2 presents measures for the breastfeeding outcomes and breastfeeding problems evaluated daily during hospital stay. By the third postpartum day, 83% of nonobese women reported EBF compared with 64% of obese women ($p=0.053$). Obese women had >50% greater chance of reporting a

Table 1. Sociodemographic, Obstetric, and Neonatal Characteristics by Body Mass Index Groups

Variables	Groups				p
	Obese ^b (N=86)		Nonobese ^b (N=138)		
	n	%	n	%	
Women					
Age (year) ^a	31.8	(5.9)	30.8	(5.9)	0.283
Schooling (years of study) ^a	11.1	(2.6)	11.1	(2.2)	0.968
Has a partner	77	89.5	126	92.0	0.535
DM/SAH ^c	47	54.6	35	25.4	<0.001
Primiparous	28	32.6	44	32.4	0.975
Vaginal delivery	42	50.6	73	53.3	0.699
Pregnancies ^a	2.9	(1.7)	2.5	(1.5)	0.088
Newborn					
Birth weight (grams) ^a	3222.2	(485.8)	3138.9	(479.6)	0.209
≥37 weeks gestational age	73	85.9	124	91.2	0.218
Skin-to-skin contact at birth	47	62.7	75	59.5	0.659
Early breastfeeding	34	42.0	55	41.4	0.929

São Paulo, 2016/2018.

^aAverage (standard deviation).

^bBody mass index.

^cDiabetes mellitus and/or Systemic Arterial Hypertension in pregnancy.

breastfeeding problem in the first and second postpartum days ($p=0.026$ and $p=0.017$, respectively) compared with nonobese group. Infants of obese women were 2.8 times more likely to have a poor latch during breastfeeding (95% CI: 1.29–6.10) on the third day. There were no differences for the other variables analyzed.

The mean LATCH score was higher (*i.e.*, better) in nonobese women compared with women with obesity (7 vs. 6; $p=0.004$) on the first postpartum day, but the difference did not persist on following days. At the time of hospital discharge, obese women (27%) had a greater probability of non-EBF than nonobese women (13.5%; $p=0.017$).

Discussion

In this study, the majority of obese women intending to exclusively breastfeed reported breastfeeding problems during hospitalization and were not exclusively breastfeeding at hospital discharge. Newborns of obese mothers demonstrated a greater chance of poor latch compared with those of nonobese mothers during the hospital stay.

As noted previously, the initiation of breastfeeding in obese women⁵ may be adversely impacted by a delay in lactogenesis,^{10,18,30} discomfort with body image and lower self-confidence,^{10,18,31,32} and large breast size.^{16,33} Breastfeeding cessation is often attributed to breast



Table 2. Body Mass Index Groups, Breastfeeding Practices, and Breastfeeding Problems During Hospital Stay

	Group				Comparison obese×nonobese			Effect of obesity at days 2 and 3		
	Obese		Nonobese		OR	95% CI	p	OR	95% CI	p
	n	%	n	%						
EBF										
Day 1	56/79	70.9	107/132	81.1	0.54	0.28–1.04	0.065	—	—	—
Day 2	56/83	67.5	103/134	76.9	0.62	0.34–1.13	0.119	1.13	0.56–2.28	0.721
Day 3	27/42	64.3	60/72	83.3	0.43	0.18–1.01	0.053	0.79	0.32–1.98	0.621
BF problems										
Day 1	44/77	57.1	52/126	41.3	1.91	1.08–3.39	0.026	—	—	—
Day 2	45/82	54.9	51/134	38.1	1.97	1.13–3.43	0.017	1.03	0.50–2.10	0.941
Day 3	19/42	45.2	29/72	40.3	1.13	0.53–2.40	0.754	0.59	0.24–1.43	0.241
Nipple damage										
Day 1	12/78	15.4	25/128	19.5	0.77	0.37–1.63	0.496	—	—	—
Day 2	23/82	28.1	50/135	37.0	0.67	0.37–1.21	0.185	0.87	0.41–1.85	0.715
Day 3	21/40	52.5	33/72	45.8	1.21	0.59–2.52	0.598	1.58	0.65–3.84	0.316
Nipple pain										
Day 1	10/78	12.8	23/128	18.0	0.67	0.30–1.48	0.318	—	—	—
Day 2	15/81	18.5	37/134	27.6	0.60	0.31–1.17	0.135	0.90	0.39–2.07	0.798
Day 3	15/40	37.5	22/71	31.0	1.46	0.68–3.13	0.327	2.19	0.85–5.66	0.106
Inadequate position of mother										
Day 1	44/78	56.4	63/126	50.0	1.27	0.72–2.24	0.407	—	—	—
Day 2	29/82	35.4	58/133	43.6	0.71	0.40–1.25	0.230	0.56	0.27–1.14	0.112
Day 3	8/41	19.5	24/72	33.3	0.53	0.22–1.29	0.162	0.42	0.16–1.13	0.085
Inadequate position of baby										
Day 1	54/76	71.1	73/123	59.4	1.65	0.90–3.03	0.108	—	—	—
Day 2	41/82	50.0	55/133	41.4	1.44	0.83–2.50	0.200	0.87	0.41–1.84	0.716
Day 3	20/42	47.6	25/72	34.7	1.67	0.78–3.57	0.190	1.01	0.40–2.53	0.982
Poor latch										
Day 1	47/78	60.3	68/128	53.1	1.28	0.73–2.27	0.389	—	—	—
Day 2	38/82	46.3	62/133	46.6	0.99	0.57–1.72	0.973	0.77	0.37–1.59	0.482
Day 3	26/42	61.9	26/72	36.1	2.81	1.29–6.10	0.009	2.19	0.88–5.43	0.092

São Paulo, 2016/2018.

EBF, exclusive breastfeeding; BF, breastfeeding; CI, confidence interval; OR, odds ratio.

problems, including nipple pain/damage, and mother-baby poor position and latch.^{34–37} Consistent with these reports, our study demonstrated that obese women had greater breastfeeding problems compared with nonobese women in the immediate postpartum period. Specifically, obese women were more likely to experience interruption of breastfeeding due to nipple pain/damage and consequences of poor latch. The larger breast size may cause a difficulty for mothers to visualize and her newborn to correctly latch.^{16,33,38} In our study, obese women had lower LATCH score than nonobese women, confirming prior reports.³⁹ Obese women were more likely to report non-EBF at discharge compared with nonobese women, in agreement with the findings of de Jersey et al.⁴⁰ A retrospective study of obese postpartum women demonstrated that EBF at hospital discharge was less prevalent among obese women,^{5,41,42} and that early breastfeeding problems adversely impacted the rate of EBF.

Our study indicates the necessity of providing tailored breastfeeding support for obese mothers.^{43–45} Among the entire maternity population, breastfeed-

ing education and support is associated with higher rates of breastfeeding initiation.⁴⁶ Support for obese women in first days after birth²³ may enable them to continue breastfeeding after hospitalization.^{16,47,48}

Health professionals, partners, and family members need to be prepared to support obese women.²³ As there is limited evidence regarding the effectiveness of educational and physical breastfeeding support for this group of women, further study is needed to develop and evaluate effectiveness of obese-specific breastfeeding support programs,⁴⁹ including social support (emotional and psychological)^{50–52} and physical support (provision of breast pumps).⁵² Others have also suggested the value of demonstration of multiple feeding positionings such as laid-back or side-lying,⁵³ support of breastfeeding with large breasts,³³ and continued support after hospital discharge⁵⁴ in providing breastfeeding support to obese women.

The limitations of this study include the comparatively small sample size from a single health service site and the lack of longer-term follow-up data.



Conclusion

Maternal obesity increased the probability of breastfeeding difficulties and non-EBF at hospital discharge. Health care professionals are encouraged to support breastfeeding techniques in the first days after birth to enable obese women to exclusively breastfeed as intended.

Considering the significant increase worldwide in the proportion of the population with high BMIs, this study highlights the importance of promoting enhanced lactation care in the immediate postpartum period to obese women. There is an urgent need to design, develop, validate, implement, and disseminate efficient strategies to support breastfeeding in this population to improve the health of the mother–child dyad and avoid the use of breast milk substitutes in the immediate newborn period.

Authors' Contributions

M.R.P., K.P.C., K.O.M., and Y.-S.C. contributed to the study conception and design. L.S.C. and A.S. analyzed the data. L.S.C., A.S., K.P.C., L.H.A., and M.G.R. contributed to the interpretation of results. M.R.P., K.P.C., L.S.C. and K.O.M. drafted the first version of the article. K.P.C., L.S.C., L.H.A., A.S., M.G.R., and Y.-S.C. revised it and made important intellectual contributions before approving the final version. All authors agree to be accountable for all aspects of the study in ensuring that questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

Author Disclosure Statement

No competing financial interests exist.

Funding Information

The research project was supported in part by Grant R01HD099813 from the National Institutes of Health, United States.

References

1. World Health Organization. Obesity and overweight. 2020. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight> Accessed August 18, 2020.
2. Brasil. Vigitel Brasil 2018: Vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico: estimativas sobre frequência e distribuição sociodemográfica de fatores de risco e proteção para doenças crônicas nas capitais ds 26 estados brasileiros e no Distrito Federal em 2018. Brasília: Ministério da Saúde, 2019. Retrieved from Brasília. Available at: <https://portalarquivos2.saude.gov.br/images/pdf/2019/julho/25/vigitel-brasil-2018.pdf> Accessed July 25, 2019.
3. Victora CG, Bahl R, Barros AJ, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *Lancet* 2016;387:475–90.
4. Boccolini CS, Boccolini PMM, Monteiro FR, Venâncio SI, Giugliano ERJ. Breastfeeding indicators trends in Brazil for three decades. *Rev Saude Publica* 2017;51:108.
5. Marshall NE, Lau B, Purnell JQ, Thornburg KL. Impact of maternal obesity and breastfeeding intention on lactation intensity and duration. *Matern Child Nutr* 2019;15:e12732.
6. Hauff LE, Leonard SA, Rasmussen KM. Associations of maternal obesity and psychosocial factors with breastfeeding intention, initiation, and duration. *Am J Clin Nutr* 2014;99:524–534.
7. Cohen SS, Alexander DD, Krebs NF, et al. Factors associated with breastfeeding initiation and continuation: A meta-analysis. *J Pediatr* 2018;203:190–196.e21.
8. Wojcicki JM, Gugig R, Tran C, Kathiravan S, Holbrook K, Heyman MB. Early exclusive breastfeeding and maternal attitudes towards infant feeding in a population of new mothers in San Francisco, California. *Breastfeed Med* 2010;5:9–15.
9. Babendure JB, Reifsnider E, Mendias E, Moramarco MW, Davila YR. Reduced breastfeeding rates among obese mothers: A review of contributing factors, clinical considerations and future directions. *Int Breastfeed J* 2015;10:21.
10. Preusting I, Brumley J, Odibo L, Spatz DL, Louis JM. Obesity as a predictor of delayed lactogenesis II. *J Hum Lact* 2017;33:684–691.
11. Donath SM, Amir LH. Maternal obesity and initiation and duration of breastfeeding: Data from the longitudinal study of Australian children. *Matern Child Nutr* 2008;4:163–170.
12. Turcsin R, Bel S, Galjaard S, Devlieger R. Maternal obesity and breastfeeding intention, initiation, intensity and duration: A systematic review. *Matern Child Nutr* 2014;10:166–183.
13. Zanardo V, Gambina I, Nicolo ME, et al. Body image and breastfeeding practices in obese mothers. *Eat Weight Disord* 2014;19:89–93.
14. Amir LH, Donath S. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC Pregnancy Childbirth* 2007;7:9.
15. Kitsantas P, Pawloski LR. Maternal obesity, health status during pregnancy, and breastfeeding initiation and duration. *J Matern Fetal Neonatal Med* 2010;23:135–141.
16. Katz KA, Nilsson I, Rasmussen KM. Danish health care providers' perception of breastfeeding difficulty experienced by women who are obese, have large breasts, or both. *J Hum Lact* 2010;26:138–147.
17. Kugyelka JG, Rasmussen KM, Frongillo EA. Maternal obesity is negatively associated with breastfeeding success among Hispanic but not black women. *J Nutr* 2004;134:1746–1753.
18. Nommsen-Rivers LA, Chantry CJ, Pearson JM, Cohen RJ, Dewey KG. Delayed onset of lactogenesis among first-time mothers is related to maternal obesity and factors associated with ineffective breastfeeding. *Am J Clin Nutr* 2010;92:574–584.
19. Buonfiglio DC, Ramos-Lobo AM, Freitas VM, et al. Obesity impairs lactation performance in mice by inducing prolactin resistance. *Sci Rep* 2016;6:22421.
20. Flint DJ, Travers MT, Barber MC, Binart N, Kelly PA. Diet-induced obesity impairs mammary development and lactogenesis in murine mammary gland. *Am J Physiol Endocrinol Metab* 2005;288:E1179–E1187.
21. Abenhaim HA, Benjamin A. Higher caesarean section rates in women with higher body mass index: Are we managing labour differently? *J Obstet Gynaecol Can* 2011;33:443–448.
22. Swanson V, Keely A, Denison FC. Does body image influence the relationship between body weight and breastfeeding maintenance in new mothers? *Br J Health Psychol* 2017;22:557–576.
23. Chang YS, Glaria AA, Davie P, Beake S, Bick D. Breastfeeding experiences and support for women who are overweight or obese: A mixed-methods systematic review. *Matern Child Nutr* 2020;16:e12865.
24. World Health Organization. Consideration of the evidence on childhood obesity for the Commission on Ending Childhood Obesity: Report of the ad hoc working group on science and evidence for ending childhood obesity, Geneva, Switzerland, 2016. Retrieved from Geneva. Available at: https://apps.who.int/iris/bitstream/handle/10665/206549/9789241565332_eng.pdf?sequence=1&isAllowed=y Accessed August 18, 2020.
25. World Health Organization. Obesity: Preventing and managing the global epidemic: Report of a WHO consultation on obesity. Geneva, 2000. Available at: https://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/ Accessed August 18, 2020.



26. Moore ER, Bergman N, Anderson GC, Medley N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev* 2016;11:CD003519.
27. World Health Organization. Infant and young child feeding: Model chapter for textbooks for medical students and allied health professionals. 2009. Available at: http://apps.who.int/iris/bitstream/handle/10665/44117/9789241597494_eng.pdf?sequence=1 Accessed August 18, 2020.
28. Conceição CM, Coca KP, Alves MRS, Almeida FA. Validation of the LATCH breastfeeding assessment instrument for the Portuguese language. *Acta Paul Enferm* 2017;30:210–216.
29. Jensen D, Wallace S, Kelsay P. LATCH: A breastfeeding charting system and documentation tool. *J Obstet Gynecol Neonatal Nurs* 1994;23:27–32.
30. Matias SL, Dewey KG, Quesenberry CP, Jr, Gunderson EP. Maternal prepregnancy obesity and insulin treatment during pregnancy are independently associated with delayed lactogenesis in women with recent gestational diabetes mellitus. *Am J Clin Nutr* 2014;99:115–121.
31. Claesson IM, Larsson L, Steen L, Alehagen S. "You just need to leave the room when you breastfeed" Breastfeeding experiences among obese women in Sweden—A qualitative study. *BMC Pregnancy Childbirth* 2018;18:39.
32. Garner CD, McKenzie SA, Devine CM, Thornburg LL, Rasmussen KM. Obese women experience multiple challenges with breastfeeding that are either unique or exacerbated by their obesity: Discoveries from a longitudinal, qualitative study. *Matern Child Nutr* 2017;13:e12344.
33. Brown D, Baker G, Hoover, K. Breastfeeding tips for women with large breasts. *J Hum Lact* 2013;29:261–262.
34. Buck M, Amir L, Cullinane M, Donath S, CASTLE Study Team. Nipple pain, damage and vasospasm in the first eight weeks postpartum. *Breastfeed Med* 2014;9:56–62.
35. Carreiro JA, Francisco AA, Abrão AC, Marcacine KO, Abuchaim ES, Coca KP. Dificuldades relacionadas ao aleitamento materno: Análise de um serviço especializado em amamentação [Breastfeeding difficulties: Analysis of a service specialized in breastfeeding]. *Acta Paul Enferm* 2018;31:430–438.
36. Gianni ML, Bettinelli ME, Manfra P, et al. Breastfeeding difficulties and risk for early breastfeeding cessation. *Nutrients* 2019;11:2266.
37. Coca KP, Amir LH, Alves M, Barbieri M, Marcacine KO, de Vilhena Abrao A CF. Measurement tools and intensity of nipple pain among women with or without damaged nipples: A quantitative systematic review. *J Adv Nurs* 2019;75:1162–1172.
38. Coca KP, Gamba MA, de Sousa e Silva R, Abrão AC. Does breastfeeding position influence the onset of nipple trauma? *Rev Esc Enferm USP* 2009;43:446–452.
39. Stuebe AM, Horton BJ, Chetwynd E, Watkins S, Grewen K, Meltzer-Brody S. Prevalence and risk factors for early, undesired weaning attributed to lactation dysfunction. *J Womens Health (Larchmt)* 2014;23:1–9.
40. de Jersey SJ, Mallan K, Forster J, Daniels LA. A prospective study of breastfeeding intentions of healthy weight and overweight women as predictors of breastfeeding outcomes. *Midwifery* 2017;53:20–27.
41. Ramji N, Challa S, Murphy PA, Quinlan J, Crane JMG. A comparison of breastfeeding rates by obesity class. *J Matern Fetal Neonatal Med* 2018;31:3021–3026.
42. Gubler T, Krahenmann F, Roos M, Zimmermann R, Ochsenein-Kolble N. Determinants of successful breastfeeding initiation in healthy term singletons: A Swiss university hospital observational study. *J Perinat Med* 2013;41:331–339.
43. Martinez JL, Chapman DJ, Perez-Escamilla R. Prepregnancy obesity class is a risk factor for failure to exclusively breastfeed at hospital discharge among Latinas. *J Hum Lact* 2016;32:258–268.
44. Visram H, Finkelstein SA, Feig D, et al. Breastfeeding intention and early post-partum practices among overweight and obese women in Ontario: A selective population-based cohort study. *J Matern Fetal Neonatal Med* 2013;26:611–615.
45. Wagner EA, Chantry CJ, Dewey KG, Nommsen-Rivers LA. Breastfeeding concerns at 3 and 7 days postpartum and feeding status at 2 months. *Pediatrics* 2013;132:e865–e875.
46. Balogun OO, O'Sullivan EJ, McFadden A, et al. Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev* 2016;11:CD001688.
47. Boudet-Berquier J, Salanave B, Desenclos JC, Castetbon K. Association between maternal prepregnancy obesity and breastfeeding duration: Data from a nationwide prospective birth cohort. *Matern Child Nutr* 2018;14:e12507.
48. Kozhimannil KB, Jou J, Attanasio LB, Joarnt LK, McGovern P. Medically complex pregnancies and early breastfeeding behaviors: A retrospective analysis. *PLoS One* 2014;9:e104820.
49. Fair FJ, Ford GL, Soltani H. Interventions for supporting the initiation and continuation of breastfeeding among women who are overweight or obese. *Cochrane Database Syst Rev* 2019;9:CD012099.
50. Carlsen EM, Kyhnaeb A, Renault KM, Cortes D, Michaelsen KF, Pryds O. Telephone-based support prolongs breastfeeding duration in obese women: A randomized trial. *Am J Clin Nutr* 2013;98:1226–1232.
51. Chapman DJ, Morel K, Bermúdez-Millán A, Young S, Damio G, Pérez-Escamilla R. Breastfeeding education and support trial for overweight and obese women: A randomized trial. *Pediatrics* 2013;131:e162–e170.
52. Rasmussen KM, Dieterich CM, Zelek ST, Altabet JD, Kjolhede CL. Interventions to increase the duration of breastfeeding in obese mothers. *J Hum Lact* 2010;26:430.
53. Mok E, Multon C, Piquel L, et al. Decreased full breastfeeding, altered practices, perceptions, and infant weight change of prepregnant obese women: A need for extra support. *Pediatrics* 2008;121:e1319–e1324.
54. Pujol von Seehausen M, Perez-Escamilla R, Oliveira MIC, Leal MC, Boccolini CS. Social support modifies the association between prepregnancy body mass index and breastfeeding initiation in Brazil. *PLoS One* 2020;15:e0233452.

Cite this article as: Perez MR, de Castro LS, Chang Y-S, Sañudo A, Marcacine KO, Amir LH, Ross MG, Coca KP (2021) Breastfeeding practices and problems among obese women compared with nonobese women in a Brazilian hospital, *Women's Health Report* 2:1, 219–226, DOI: 10.1089/whr.2021.0021.

Abbreviations Used

- BF = breastfeeding
- BMI = body mass index
- CI = confidence interval
- EBF = exclusive breastfeeding
- OR = odds ratio
- SD = standard deviation
- WHO = World Health Organization

Publish in Women's Health Reports

- Immediate, unrestricted online access
- Rigorous peer review
- Compliance with open access mandates
- Authors retain copyright
- Highly indexed
- Targeted email marketing

liebertpub.com/whr

