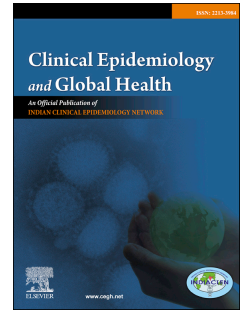


# Journal Pre-proof

Early predictors of short duration of exclusive breastfeeding among Havana women

Mercedes Esquivel Lauzurique, Yeneir Vera Fernández, Cindy-Lee Dennis, Stephen Lye, Mercedes Ruben Quesada, Ciro González Fernández, Gisela Álvarez Valdés, Vilma Tamayo Pérez, Maida Rancel Hernández



PII: S2213-3984(22)00140-3

DOI: <https://doi.org/10.1016/j.cegh.2022.101098>

Reference: CEGH 101098

To appear in: *Clinical Epidemiology and Global Health*

Received Date: 28 January 2022

Revised Date: 27 April 2022

Accepted Date: 17 June 2022

Please cite this article as: Lauzurique ME, Fernández YV, Dennis CL, Lye S, Quesada MR, Fernández Ciro.Gonzá., Valdés Gisela.Á., Pérez VT, Hernández MR, Early predictors of short duration of exclusive breastfeeding among Havana women, *Clinical Epidemiology and Global Health* (2022), doi: <https://doi.org/10.1016/j.cegh.2022.101098>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2022 Published by Elsevier B.V. on behalf of INDIACLEN.

**Title: Early Predictors of short duration of exclusive breastfeeding among Havana women**

**Running title: Predictors of short duration of EBF in Cuban women**

Mercedes Esquivel, Yeneir Vera, Cindy-Lee Dennis, Stephen Lye, Mercedes Ruben, Ciro González, Gisela Álvarez, Vilma Tamayo, Maida Rancel.

**Mercedes Esquivel Lauzurique**, specialist in Pediatrics with a Doctorate in Medical Sciences. Principal researcher. School Health Department. Head of the National Growth and Human Development. University of Medical Sciences. Havana, Cuba. [mesqui@infomed.sld.cu](mailto:mesqui@infomed.sld.cu)  
<https://orcid.org/0000-0001-8964-6040>

**Yeneir Vera Fernández**, Medical Doctor, specialist in Cardiology with a master's degree in Global Health and Child Welfare. Research Associate at the Alliance for Human Development. Lunenfeld-Tanenbaum-Research Institute. Sinai Health System. Toronto, Ontario, Canada. [vfernandez@lunenfeld.ca](mailto:vfernandez@lunenfeld.ca) <https://orcid.org/0000-0003-1420-6256>

**Cindy-Lee Dennis**, Doctor of Science in Nursing. Principal Investigator, University of Toronto and St. Michael's Hospital Toronto, Ontario, Canada. Email: [cindylee.dennis@utoronto.ca](mailto:cindylee.dennis@utoronto.ca).  
<https://orcid.org/0000-0002-0135-7242>

**Stephen Lye**, Senior Investigator at Lunenfeld-Tanenbaum and Executive Director at the Alliance for Human Development. Professor Maternal-Fetal Medicine. Lunenfeld-Tanenbaum-Research Institute. Sinai Health System. Toronto, Ontario, Canada. Email: [lye@lunenfeld.ca](mailto:lye@lunenfeld.ca)

**Mercedes Ruben Quesada**, mathematician with a Ph.D. in Mathematical Sciences. Associate Professor. Faculty of Medical Sciences Victoria de Girón, University Medical Sciences of Havana, Cuba. [mruben@infomed.sld.cu](mailto:mruben@infomed.sld.cu). <https://orcid.org/0000-0002-8667-5337>

**Ciro González Fernández**, mathematician with a Master's degree in Applied Statistics. Assistant Researcher. Julio Trigo López Faculty of Medical Sciences, University of Medical Sciences of Havana, Cuba. [ciro@infomed.sld.cu](mailto:ciro@infomed.sld.cu) <https://orcid.org/0000-0001-5905-1476>

**Gisela Álvarez Valdés**, a specialist in Pediatrics with a Master's Degree in Comprehensive Child Care. Assistant teacher. Teaching Polyclinic Julián Grimau. Havana Cuba. [gisela.alvarez@infomed.sld.cu](mailto:gisela.alvarez@infomed.sld.cu). <https://orcid.org/0000-0003-1619-5693>

**Vilma Tamayo Pérez**, a specialist in Pediatrics with a Master's Degree in Comprehensive Child Care. Added Researcher. School Health Department. Institute of Hygiene, Epidemiology and Microbiology. Havana Cuba. [vilmayo@infomed.sld.cu](mailto:vilmayo@infomed.sld.cu). <https://orcid.org/0000-0003-4827-4978>

**Maida Rancel Hernández**, a psychologist with a master's degree in Medical Education. Associate Professor. Julio Trigo López Faculty of Medical Sciences, University of Medical Sciences of Havana, Cuba. [mrancel@infomed.sld.cu](mailto:mrancel@infomed.sld.cu). <https://orcid.org/0000-0003-2854-4424>

**Corresponding Author: Cindy-Lee Dennis**, Doctor of Science in Nursing. Principal Investigator at the Women's College Research Institute and St. Michael's Hospital Toronto, Ontario. Canada. Email: [cindylee.dennis@utoronto.ca](mailto:cindylee.dennis@utoronto.ca). <https://orcid.org/0000-0002-0135-7242>

**Funding Statement:** This work was supported through a Canada Research Chair held by C-L Dennis.

**Disclosure statement:** The authors report there are no competing interests to declare.

**Data availability statement:** The data that support the findings of this study are available from the corresponding author, CLD, upon reasonable request.

**Word Count:** 2,802

**Total references:** 40

**Number of tables:** 3

**Number of figures:** 0

**Title: Early Predictors of short duration of exclusive breastfeeding among Havana women****ABSTRACT**

**Problem:** In Cuba, only 40.9% of infants under the age of six-months are exclusively breastfed with the average duration of exclusivity being only 2.4 months. Evidence to guide the development of breastfeeding interventions among Cuban women to achieve exclusive breastfeeding to 6-months is limited. The objective was to identify early predictors for discontinuation of exclusive breastfeeding before 6-months among Cuban women.

**Methods:** In a cohort study, 273 maternal-infant pairs were recruited immediately following childbirth at a public hospital in Havana, Cuba and followed up to six months postpartum. A univariate and multivariate strategy was used to identify early predictors of the discontinuation of exclusive breastfeeding before six months.

**Results:** While all women were exclusively breastfeeding at hospital discharge, only 20.5% continued to six-months postpartum. The average duration of exclusive breastfeeding was 3.13 months (SD  $\pm$  2.14 months). Factors associated with the early discontinuation of exclusive breastfeeding were: (1) breastfeeding not initiated within the first hour of birth, (2) infant birthweight <3.3 kgs, (3) pacifier use, (4) maternal dissatisfaction with infant growth, (5) maternal mental health problems at one month and (6) low breastfeeding self-efficacy at birth and one month. In the multivariate analysis, only maternal dissatisfaction with infant growth progress at one month and birth weight <3.3 kg predicted the early discontinuation of exclusive breastfeeding.

**Conclusion:** Mothers who gave birth to an infant with a lower birth weight and were dissatisfied with their infant's growth trajectory were high risk to prematurely discontinue exclusive breastfeeding before 6 months.

**Keywords:** exclusive breastfeeding, risk factors, infant, Cuban women.

## INTRODUCTION

The World Health Organization (WHO) recommends breastfeeding should be initiated within the first hour of birth and continued exclusively to six months postpartum.<sup>1,2</sup> It has been well documented over the past 30 years that breastfeeding has a significant positive effect on child health and development.<sup>3-6</sup> Further, there is ever-growing evidence to suggest that an increase in duration of exclusive breastfeeding may be associated with a reduction in the risk of the child being overweight and developing obesity later in life.<sup>4,7</sup> Given that obesity is an important risk factor for cardiovascular disease, diabetes, and mental health, exclusive breastfeeding to six months postpartum may be an important preventative strategy to address the rising rates of non-communicable diseases.<sup>8,9</sup> Breastfeeding is also beneficial for mothers since it may provide protection against postpartum hemorrhage, breast and ovarian cancers, and type 2 diabetes mellitus.<sup>2</sup> The scaling up of breastfeeding to a near universal level internationally could prevent 823,000 annual deaths in children younger than 5 years and 20,000 annual deaths from breast cancer.<sup>10</sup>

Despite these important short and long-term benefits, globally only 42% of infants less than six-months of age are exclusively breastfed.<sup>11</sup> In Cuba, only 40.9% of infants under the age of six-months are exclusively breastfed with the average duration of exclusivity being only 2.4 months.<sup>12</sup> While the Cuban government has made a significant investment into improving maternal and child health outcomes, breastfeeding exclusivity to six months remains an unattained goal. The Cuban government is aligned with the WHO Nutrition Goals and the Sustainable Development Goals and has set a goal to increase exclusive breastfeeding prevalence rate to 50% by 2025 among infants under six-months of age.<sup>13</sup> Evidence to guide the development of breastfeeding interventions among Cuban women to achieve this goal is limited as there is no data to identify potential targetable risk factors to support continued exclusivity. To date, Cuban breastfeeding studies have been primarily descriptive<sup>14</sup> and little is known about modifiable behaviors that influence the duration of exclusive breastfeeding to

six-months postpartum. The purpose of this study was to identify early predictors of the discontinuation of exclusive breastfeeding before six months among Cuban women. These data will be used to guide the development of culturally appropriate breastfeeding support interventions.

## METHODS

### Participants and procedures

A prospective cohort study was conducted where mother-infant pairs were recruited immediately after birth at Ángel Arturo Aballí Hospital in Havana, Cuba. This hospital is a maternal and Child hospital that holds the status of Mother and Child Friendly Hospital, which implements the ten steps established for successful breastfeeding. In Cuba, almost all (99%) of the deliveries are institutional, and most women are discharged within 48 hours if they do not have any complications.

Recruitment occurred from January to June 2016 among mothers who resided in the health care areas of the Los Pinos, Capri, Párraga and Grimau polyclinics. For women to be considered eligible, they had to have a live singleton term birth and they were excluded if they had a severe health condition during pregnancy or the postpartum period that could interfere with breastfeeding or an infant who required NICU care. Following informed consent procedures, pediatricians conducted semi-structured interviews with participants in the immediate postpartum period before hospital discharge. Subsequent follow-up interviews were conducted every 4 weeks ( $\pm 3$  days) during the child's well-baby visit at the local health clinics by trained research staff until six-months postpartum. The Ethics Committee of the School of Medical Sciences Julio Trigo López approved the project protocol as did the Ministry of Health of Cuba.

### Predictor Variables

Exclusive breastfeeding was defined as no other food or drink, not even water, except breast milk (including expressed breast milk) to 6 months postpartum.<sup>15</sup> The discontinuation

of exclusive breastfeeding before six months was considered the dependent variable in this study. The independent variables were classified into four domains: (1) sociodemographic, (2) obstetric and infant health, (3) maternal satisfaction with support and infant growth, and (4) maternal psychological state.

*Sociodemographic variables* included: maternal age (<20, 20-35, > 35 years); skin color (white, black, mestizo); highest level of education completed (elementary school, high school, university); occupation (housewife, state worker, other); cohabiting with the infant's father (yes, no); maternal smoking status at one month (yes, no); and family functioning using the measure developed by Louro<sup>16</sup> where scores 70-57 = good family functioning, 56-43 = moderate family functioning, and  $\leq 42$  = poor family functioning. *Obstetric and infant variables* included: parity (primiparous, multiparous), type of delivery (vaginal, cesarean section), initiation of breastfeeding in the first hour of delivery (yes, no), informed about the benefits of exclusive breastfeeding (yes, no), infant sex (male, female), birth weight ( $\geq 3.3$  kg, which was the sample's mean birth weight, <3.3 kg), and use of a pacifier at one month of age (yes, no). *Maternal satisfaction variables* included: perceptions of breastfeeding progress (satisfied, unsatisfied), partner breastfeeding support (satisfied, unsatisfied), family and friends breastfeeding support (satisfied, unsatisfied), and infant growth trajectory (very satisfied, satisfied, and unsatisfied).

Finally, variables assessing *maternal psychological state* included: anxiety assessed using the State-Trait Anxiety Inventory (STAI) (no presence of anxiety:  $\leq 40$  or presence of anxiety:  $> 40$ )<sup>17,18</sup> and depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS) (no presence of depression symptoms:  $\leq 9$  or presence of depression symptoms:  $> 9$ ).<sup>19</sup> The presence of comorbid anxiety and depression (STAI  $> 40$  and EPDS  $> 9$ ) were also assessed. Maternal breastfeeding self-efficacy was examined in- hospital and at one-month postpartum using the Spanish version of the Breastfeeding Self-Efficacy Scale-short form

(BSES-SF) developed by Dennis<sup>20</sup> and validated in Spanish by Oliver.<sup>21</sup> High breastfeeding self-efficacy was a BSES-SF score  $\geq$  than the sample mean.

### **Statistical analysis**

Descriptive statistics were summarized using absolute numbers and percentages, means, and standard deviations. The dependent variable was average duration in months of exclusive breastfeeding. The univariate associations between the independent variables selected and the duration of exclusive breastfeeding were explored by comparing, with the use of t-test and ANOVA, the means of duration of exclusive breastfeeding in months according to categories of above-mentioned variables. The percentages of missing data for the independent variables were less than 10%. To estimate the strength of the association in the cases where this was significant, the Odds Ratio (OR) was calculated using a 95% Confidence Interval (CI). From these results, a multivariate analysis was performed using multiple logistic regression with dichotomous responses to assess which variables contributed to a significant independent risk of short duration of exclusive breastfeeding and only significant variables were included in the final model. The data did not show multicollinearity between the predictor variables. With the information obtained, data was processed using the SPSS Version 22 program.

## **RESULTS**

During the six months of recruitment, 341 women were eligible to participate in the study and were recruited. Of these, 273 (80.0%) completed the monthly interviews to six-months postpartum. Reasons for withdrawal included moving out of the study area (n=13, 3.8%), refusal to complete a follow up interview (n=8, 2.3%), and living outside the geographical area despite being cared for during pregnancy within the area (n=47, 13.8%).

All participants were exclusively breastfeeding at hospital discharge. The percentage of women exclusive breastfeeding declined steadily to 82.1% at one-month, 61.9% at three-months and 20.5% at six-months postpartum. About half of the women were mestizo



ethnicity (51.6%), had high school education or more (52.0%), and classified themselves as housewives (54.2%). The majority were between 20 and 35 years old (75.8%), lived with the infant's father (86.4%), and were considered living in a functional family (62.3%).

Approximately two-thirds of women were primiparous (61%), had a vaginal delivery (61.0%), and breastfed their infant in the first hour after birth (60.8%). A high percentage (82.4%) reported being informed about the benefits of breastfeeding and 83.2% were satisfied with the progress of breastfeeding in-hospital. At one-month, 81.9% of women were satisfied with their infant's growth, 75.8% were satisfied with the breastfeeding support from their partner, and 71.8% reported being satisfied with their family support. As for the infants, 50.2% were male, 51.1% had a birth weight  $\geq 3.3$  kg, and 24.2% used a pacifier at one-month of age.

The mean score for the breastfeeding-self-efficacy scale did not change significantly from hospital discharge (M: 60.6; SD  $\pm$  7.2) to one-month postpartum (M: 60.2; SD  $\pm$  8.9). In total, 48.0% of mothers in-hospital and 51.4% at one-month were classified as having high breastfeeding self-efficacy. Ten percent of women had high anxiety with an STAI score  $> 40$  in the immediate postpartum period, increasing slightly to 12.0% at one-month. Similarly, 17.6% had depressive symptoms in the immediate postpartum period as demonstrated with an EPDS score  $> 9$  decreasing to 11.3% at one-month. Comorbid symptoms of both high anxiety and depressive symptoms were reported by 3.1% of women in the immediate postpartum period, increasing to 6.4% at one-month.

### **Variables associated with the duration of exclusive breastfeeding**

The mean duration of exclusive breastfeeding was 3.13 months (SD  $\pm$  2.14). Variables associated with the average monthly duration of exclusive breastfeeding included: not initiating breastfeeding during the first hour after birth ( $p = .008$ ), infant birthweight  $< 3.3$ kg ( $p = .003$ ), use of a pacifier at one-month ( $p = .003$ ), dissatisfaction with infant growth at one-month ( $p = .001$ ), low breastfeeding self-efficacy in-hospital ( $p = .041$ ) and at one-

month ( $p = .003$ ), high anxiety ( $p = .050$ ), symptoms of depression ( $p = .008$ ) or comorbidity ( $p = 0.08$ ) at one-month (Table 1). Building upon these differences, the following variables significantly predicted a shorter duration of exclusive breastfeeding: did not initiate breastfeeding after the first hour of birth (OR: 1.84, 95% CI: 1.11-3.04), infant birthweight < 3.3 kg (OR: 1.88, 95% CI: 1.15-3.08), pacifier use at one month (OR: 1.98, 95% CI: 1.11-3.55), mother dissatisfaction with infant growth at one month (OR: 3.02; CI : 95%: 1.53-5.95), low breastfeeding self-efficacy in- hospital (OR:1.85; IC 95%:1.06-3.22) and at one-month (OR: 1.89, 95% CI: 1.13-3.15), maternal anxiety (OR: 2.93, 95% CI: 1.33-6.46), depression (OR: 2.60, 95% CI: 1.17-5.77) or comorbidity (anxiety and depression) (OR: 3.73, 95% CI: 1.27-10.92) at one-month (Table 2).

In multivariate analysis, the only variables that remained in the final model as independent predictors of short duration of exclusive breastfeeding included: dissatisfaction with infant growth at one month (OR: 3.164; 95% CI: 1.373 -7.288) and birth weight <3.3 kg (OR: 1.898; 95% CI: 1.010-3.569, Table 3). The Hosmer Lemeshow test (Chi-square = .108;  $p = .948$ ) showed that there were no significant differences between the observed and expected values of the dependent variable, suggesting that the model obtained fitted the data well (OR:1.85; IC 95%:1.06-3.22).

## DISCUSSION

Focusing on the purpose of this study, this is the first study among Cuban women to examine factors predictive of a short duration/discontinuation of exclusive breastfeeding before six months postpartum. Overall, we found a high rates of exclusive breastfeeding at one month (82.1%) at one-month which decreased to 61.9% at three-months postpartum. However, there was a significant drop in exclusivity to 20.5% at six-months postpartum. Among the sociodemographic and other variables examined to identify predictors of a shorter duration of

exclusivity only infant birth weight and maternal satisfaction with infant growth at one-month postpartum were significant.

According to UNICEF data, 91.8% of infants are breastfed for the first 2 days after birth and 40.6% are exclusively breastfed up to 5 months of age.<sup>22</sup> Cuba rates are similar to the global average of exclusive breastfeeding up to 5 months of age (44%) and slightly higher than the Latin American & Caribbean average at 37%.<sup>22</sup> Thus, our findings are consistent with the national rates and provide valuable insight into the decline in exclusive breastfeeding between birth and 6-months postpartum. The multivariate logistic regression identified two factors that influenced the duration of exclusive breastfeeding, and both focused on infant weight. The dissatisfaction of the mothers with the progress of the infant's growth at one-month of age and the birth weight less than 3.3 kg were early predictors of shorter duration of exclusive breastfeeding, increasing the probability more than twice. Other studies have found that mothers who have concern around infant weight gain can be a potential risk factor for cessation of exclusive breastfeeding.<sup>23</sup> It is not necessarily the weight itself that is an issue, as 3.3kg is reflects the mean of this sample rather than a clinically low birth weight; but more so mothers' perceptions about growth of their children if they are less than the average in the population. This could be possibly influenced by social reasons in that mothers consider "bigger is better" whereby they associate the presence of overweight in the infant with better health, which leads them to use early milk formula and complementary foods to increase the weight of the infant.<sup>24</sup> Similarly, evidence suggest that infants with lower birth weight are more likely to have a shorter duration of exclusive breastfeeding.<sup>25,26</sup> Thus, the current findings, along with existing evidence, suggest that these risk factors should alert health professionals about the increased risk of early abandonment of exclusive breastfeeding. Further interventions should focus on identifying strategies to improve exclusive breastfeeding among mothers concerned about their infant's weight.

Results of this study are interesting in that no association was found between maternal age, education, partner support or family functioning and breastfeeding exclusivity. This is contradictory to previous research which has highlighted the importance of maternal demographic factors and her support system.<sup>27</sup> The universal coverage of the Cuban Health System and the guidelines of the Maternal and Child Health Program (MCHP), which provides ten antenatal visits among women with uncomplicated pregnancies, and biweekly follow-up visits in the first three months moving to monthly afterwards for the first year postpartum<sup>28,29</sup> may have attenuated the differences that other authors have identified in relation to demographic and social variables.

Among delivery and hospital practice variables analyzed, only breastfeeding initiated within the first hour of birth showed a significant association with the duration of exclusive breastfeeding. Early initiation of breastfeeding is one of the Baby Friendly Hospital Initiative recommendations suggested by the WHO to support the continuation of breastfeeding.<sup>2</sup> Considering national data, only 64.1% of Cuban mothers met this WHO recommendations<sup>30</sup> yet the current study found that 100% of infants were being exclusive breastfeed upon hospital discharge. Regardless, breastfeeding initiation soon after delivery requires attention and is an important area to target the improvement of postpartum care. Parity and type of delivery were not associated with breastfeeding exclusivity among Cuban women, a finding similar to some research<sup>31</sup> but not others.<sup>32</sup>

Most of the women reported being informed of the benefits of exclusive breastfeeding but this did not translate into continued exclusivity to 6 months postpartum. Interventions related to breastfeeding oftentimes have several components: social and media mobilization, development of legislation, policies, and financing and, in addition, counseling along with support and management at the individual level of breastfeeding.<sup>33</sup> In Cuba, as part of the social protection system, working mothers receive a paid prenatal leave from 34 weeks of gestation that extends through the first year postpartum.<sup>34</sup> Clearly education alone is

insufficient to improve breastfeeding outcomes and a multi-pronged approach is required, including counselling and health system changes.<sup>35</sup> Evidence suggests that breastfeeding interventions spanning the whole perinatal period (e.g., delivered across the antenatal and postnatal period) are often the most effective at improving exclusive breastfeeding,<sup>36,37</sup>

The variables that were related to the psychological state were of great interest given they have not been previously studied with Cuban women. Low breastfeeding self-efficacy and the presence of mental health concerns such as anxiety, depression, or co-morbidity in women at the immediate postpartum period and at one-month significantly increased the risk for a shorter duration of exclusive breastfeeding. Dennis<sup>38</sup> defined breastfeeding self-efficacy as a mother's confidence in her ability to breastfeed and predicts whether a mother chooses to breastfeed, how much effort she will expend, whether she will have self-enhancing or self-defeating thought patterns, and how she will emotionally respond to breastfeeding difficulties. Our results confirm similar findings reported by the literature, with higher breastfeeding self-efficacy associated with increased exclusive breastfeeding rates.<sup>39-41</sup> Systematic reviews have also found that postpartum depression and anxiety are associated with lower breastfeeding duration and exclusivity rates.<sup>41-43</sup> Overall, breastfeeding self-efficacy, anxiety, and depression were associated with a shorter duration of exclusive breastfeeding exclusive duration but not predictive. Further, research is warranted to examine the relationship between maternal mental health and infant feeding behaviours.

### **LIMITATIONS**

This cohort was limited to women residing in one of the participating municipalities of the province of Havana, reducing generalizability to the larger Cuban population. Future work could replicate this study in women who live in other conditions or reside in other provinces to identify whether the short-term predictors of exclusive breastfeeding identified are similar. The data lost in some variables may also have produced some bias in the sample.

The list of predictors was extensive but obviously did not exhaust all those factors that have been reported in the literature associated with the breastfeeding process.

### CONCLUSION

This was the first study among Cuban women to explore factors predictive of the early discontinuation of exclusive breastfeeding. Infant birth weight below 3.3kg and maternal dissatisfaction with the progress in the growth of the infant at one month of age were the only variables predictive of a shorter duration of exclusive breastfeeding. Interventions that target maternal perceptions of infant growth are needed to assist Cuban families to continue exclusive breastfeeding. Further research is warranted to examine breastfeeding self-efficacy and its influence of maternal confidence in infant growth. The relationship between maternal mental health and infant feeding behaviors also requires additional attention given the well-documented negative relationship. The results from this first-ever study provide invaluable information to guide policies aimed at increasing the use of exclusive breastfeeding in this population.

**Funding Statement:** This work was supported through a Canada Research Chair held by C-L Dennis.

**Disclosure statement:** The authors report there are no competing interests to declare.

**Data availability statement:** The data that support the findings of this study are available from the corresponding author, CLD, upon reasonable request.

## REFERENCES

1. World Health Organization. Exclusive breastfeeding for six months best for babies everywhere. Statement. Published 2011. Accessed December 9, 2021. <https://www.who.int/news/item/15-01-2011-exclusive-breastfeeding-for-six-months-best-for-babies-everywhere>
2. UNICEF. *Breastfeeding: A Mother's Gift for Every Child.*; 2018.
3. Horta BL, Loret De Mola C, Victora CG. Breastfeeding and intelligence: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics*. 2015;104:14-19. doi:10.1111/apa.13139
4. Yan J, Liu L, Zhu Y, Huang G, Wang PP. The association between breastfeeding and childhood obesity: a meta-analysis. *BMC Public Health*. 2014;14:1267. doi:10.1186/1471-2458-14-1267
5. Horta BL, Loret De Mola C, Victora CG. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics*. 2015;104:30-37. doi:10.1111/apa.13133
6. Sankar MJ, Sinha B, Chowdhury R, et al. Optimal breastfeeding practices and infant and child mortality: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics*. 2015;104:3-13. doi:10.1111/apa.13147
7. Abarin T, Yan Wu Y, Warrington N, Lye S, Pennell C, Briollais L. The impact of breastfeeding on FTO-related BMI growth trajectories: an application to the Raine pregnancy cohort study. *Int J Epidemiol*. 2012;41(6):1650-1660. doi:10.1093/ije/dys171
8. Boivin M, Pérusse D, Dionne G, et al. The genetic-environmental etiology of parents' perceptions and self-assessed behaviours toward their 5-month-old infants in a large twin and singleton sample. *J Child Psychol Psychiatry*. 2005;46(6):612-630. doi:10.1111/j.1469-7610.2004.00375.x
9. Yeste D, Carrascosa A. [Obesity-related metabolic disorders in childhood and adolescence]. *Anales de pediatria (Barcelona, Spain : 2003)*. 2011;75(2):135.e1-9. doi:10.1016/j.anpedi.2011.03.025
10. Victora CG, Bahl R, Barros AJD, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *The Lancet*. 2016;387(10017):475-490. doi:10.1016/S0140-6736(15)01024-7
11. UNICEF. Global Breastfeeding Scorecard, 2017. Tracking Progress for Breastfeeding Policies and Programmes. Webpage. Published 2017. Accessed February 20, 2019. <http://www.unicef.org/breastfeeding>.
12. Dirección de Registros Médicos y Estadísticas de Salud. *Anuario Estadístico de Salud 2018.*; 2019.
13. World Health Organization. Global targets 2025. To improve maternal, infant and young child nutrition. Webpage. Published 2014. Accessed January 23, 2019. [nutrition/topics/nutrition\\_globaltargets2025/en/](https://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/)
14. Fernández Brizuela E de J. Estudio bibliométrico sobre lactancia materna en las revistas médicas cubanas durante el período 2009-2013 . *Revista Cubana de Información en Ciencias de la Salud* . 2014;25:270-284.
15. World Health Organization. Infant and young child feeding. Webpage. Published 2021. Accessed January 5, 2022. <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>
16. Louro I. Familia en el ejercicio de la medicina general integral. In: Alvares R, Hernández G, Báster J, García R, eds. *Medicina General Integral*. 2da ed. Ecimed; 2008:398-419.



17. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: systematic review and meta-analysis. *Br J Psychiatry*. 2017;210(5):315-323.
18. Grigoriadis S, Graves L, Peer M, et al. Maternal Anxiety During Pregnancy and the Association With Adverse Perinatal Outcomes: Systematic Review and Meta-Analysis. *J Clin Psychiatry*. 2018;79(5). doi:10.4088/JCP.17r12011
19. Dennis CL, Falah-Hassani K, Shiri R. Prevalence of antenatal and postnatal anxiety: Systematic review and meta-analysis. *British Journal of Psychiatry*. 2017;210(5):315-323. doi:10.1192/bjp.bp.116.187179
20. Dennis CL, Creedy D. Psychosocial and psychological interventions for preventing postpartum depression. *Cochrane Database Syst Rev*. 2013;(4):CD001134. doi:10.1002/14651858.CD001134.pub2
21. Oliver-Roig A, D'Anglade-González MLL, García-García B, Silva-Tubio JRR, Richart-Martínez M, Dennis CLL. The Spanish version of the Breastfeeding Self-Efficacy Scale-Short Form: Reliability and validity assessment. *International Journal of Nursing Studies*. 2012;49(2):169-173. doi:10.1016/j.ijnurstu.2011.08.005
22. UNICEF. Infant and young child feeding (IYCF) data. Webpage. Published 2021. Accessed January 14, 2022. <https://data.unicef.org/resources/dataset/infant-young-child-feeding/>
23. DiTomasso D, Wambach KA, Roberts MB, Erickson-Owens DA, Quigley A, Newbury JM. Maternal Worry About Infant Weight and its Influence on Artificial Milk Supplementation and Breastfeeding Cessation. *Journal of Human Lactation*. 2021;00(0):1-13. doi:10.1177/08903344211000284
24. Nasser A, Omer F, Al-Lenqawi F, et al. Predictors of Continued Breastfeeding at One Year among Women Attending Primary Healthcare Centers in Qatar: A Cross-Sectional Study. *Nutrients*. 2018;10(8). doi:10.3390/nu10080983
25. Flaherman VJ, McKean M, Cabana MD. Higher Birth Weight Improves Rates of Exclusive Breastfeeding Through 3 Months. *Infant, Child, and Adolescent Nutrition*. 2013;5(4):200-203. doi:10.1177/1941406413495089
26. Matias SL, Nommsen-Rivers LA, Dewey KG. Determinants of exclusive breastfeeding in a cohort of primiparous periurban peruvian mothers. *Journal of Human Lactation*. 2012;28(1):45-54. doi:10.1177/0890334411422703
27. Meedya S, Fahy K, Kable A. Factors that positively influence breastfeeding duration to 6 months: a literature review. *Women Birth*. 2010;23(4):135-145. doi:10.1016/j.wombi.2010.02.002
28. Castro-Pacheco BL, Cuellar Alvarez R, Ibargollen Negrin L, Equivel Lauzurique M, Machado Lubian M, Matinez Corredera A. *Cuban Experience in Child Health Care 1959-2006.*; 2010.
29. Esquivel M, Álvarez G, Izquierdo ME, Martínez D, Tamayo V. Well child care: a comprehensive strategy for Cuban children and adolescents. *MEDICC Rev*. 2014;16(1):7-11. doi:10.37757/MR2014.V16.N1.3
30. Ministerio de Salud Pública. Dirección de Registros Médicos y Estadísticas de Salud. *Encuesta de Indicadores Múltiples Por Conglomerados. Cuba, 2019.*; 2020.
31. Fukui N, Motegi T, Watanabe Y, et al. Exclusive Breastfeeding Is Not Associated with Maternal-Infant Bonding in Early Postpartum, Considering Depression, Anxiety, and Parity. *Nutrients*. 2021;13(4). doi:10.3390/nu13041184



32. Hussien J, Assefa S, Liben ML. Breastfeeding performance in Afar regional state, northeastern Ethiopia: a cross sectional study. *BMC Pediatr.* 2018;18(1):375. doi:10.1186/s12887-018-1353-y
33. Rollins NC, Bhandari N, Hajeebhoy N, et al. Why invest, and what it will take to improve breastfeeding practices? *Lancet.* 2016;387(10017):491-504. doi:10.1016/S0140-6736(15)01044-2
34. UNICEF. Early childhood development in Cuba. Webpage. Published 2016. Accessed February 10, 2019. [https://www.unicef.org/cuba/cu\\_resources\\_earlychildhooddevelopmentlibro.pdf](https://www.unicef.org/cuba/cu_resources_earlychildhooddevelopmentlibro.pdf)
35. Sinha B, Chowdhury R, Sankar MJ, et al. Interventions to improve breastfeeding outcomes: A systematic review and meta-analysis. *Acta Paediatrica, International Journal of Paediatrics.* 2015;104:114-135. doi:10.1111/apa.13127
36. Wong MS, Mou H, Chien WT. Effectiveness of educational and supportive intervention for primiparous women on breastfeeding related outcomes and breastfeeding self-efficacy: A systematic review and meta-analysis. *International Journal of Nursing Studies.* 2021;117:103874. doi:<https://doi.org/10.1016/j.ijnurstu.2021.103874>
37. Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health.* 2011;11(Suppl 3).
38. Dennis CL. Theoretical underpinnings of breastfeeding confidence: a self-efficacy framework. *Journal of human lactation : official journal of International Lactation Consultant Association.* 1999;15(3):195-201. doi:10.1177/089033449901500303
39. Mituki D, Tuitoek P, Varpolatai A, Taabu I. Translation and validation of the breast feeding self efficacy scale into the Kiswahili language in resource restricted setting in Thika Kenya. In: ; 2017.
40. Machado MCM, Assis KF, Oliveira F de CC, et al. Determinants of the exclusive breastfeeding abandonment: psychosocial factors. *Revista de saude publica.* 2014;48(6):985-994. doi:10.1590/S0034-8910.2014048005340
41. de Jager E, Skouteris H, Broadbent J, Amir L, Mellor K. Psychosocial correlates of exclusive breastfeeding: A systematic review. *Midwifery.* 2013;29(5):506-518. doi:10.1016/j.midw.2012.04.009
42. Hoff CE, Movva N, Rosen Vollmar AK, Pérez-Escamilla R. Impact of Maternal Anxiety on Breastfeeding Outcomes: A Systematic Review. *Advances in Nutrition.* 2019;10(5):816-826. doi:10.1093/advances/nmy132
43. Kim S, Park M, Ahn S. The Impact of Antepartum Depression and Postpartum Depression on Exclusive Breastfeeding: A Systematic Review and Meta-Analysis. *Clinical Nursing Research.* Published online 2021. doi:10.1177/10547738211053507

Table 1. Maternal variables and differences in mean duration (in months) of exclusive breastfeeding

VARIABLE	CATEGORIES	N	(%)	Mean duration of breastfeeding <sup>a</sup>	SD <sup>b</sup>	P <sup>*</sup>
<b>SOCIO-DEMOGRAPHIC VARIABLES</b>						
Race	White	105	38.5	2.94	2.152	0.485
	Black	27	9.9	3.19	2.298	
	Mestizo	141	51.6	3.27	2.074	
Age	< 20	43	15.8	3.10	1.961	0.807
	20-35	207	75.8	3.17	2.140	
	>35	23	8.4	2.86	2.494	
Level of Education	Elementary School	99	36.3	3.09	2.167	0.059
	High School	142	52.0	2.95	2.074	
	University	32	11.7	3.94	2.124	
Occupation	Housewife	148	54.2	3.13	2.195	0.784
	State worker	101	37.0	3.17	2.059	
	Others	24	8.8	2.83	2.057	
Family functioning Marital status of the parents	Functional	157	62.3	3.32	2.121	.497
	Moderately functional	71	28.2	2.96	2.045	
	Dysfunctional	24	9.5	3.21	2.413	
Mother living with the infant's father	Yes	236	86.4	3.14	2.153	.719
	No	37	13.6	3.00	1.986	
Mother's smoking status 1month	Yes	29	10.6	2.65	2.497	.174
	No	244	89.4	3.25	2.044	
<b>OBSTETRIC VARIABLES AND RELATED TO THE INFANT</b>						
Parity	Primiparous	167	61.2	3.14	2.036	.846
	Multiparous	106	38.8	3.08	2.277	
Delivery type	Vaginal	166	61.0	3.30	2.172	.086
	Caesarean Section	106	39.0	2.84	2.048	
Breastfeeding initiated within the first hour of birth	Yes	161	60.8	3.41	2.164	.008**
	No	107	39.2	2.70	2.033	
Informed of EB benefits	Yes	225	82.4	3.03	2.148	.167
	No	48	17.6	3.50	2.032	
Infant's sex	Male	137	50.2	3.03	2.054	.494
	Female	136	49.8	3.21	2.205	
Birthweight	< 3.3 kg	133	48.9	2.74	2.095	.003**
	≥ 3.3 kg	139	51.1	3.50	2.093	
Uses pacifier at 1 month	Yes	66	24.2	2.56	2.240	.010**
	No	207	75.8	3.35	2.049	
<b>VARIABLES RELATED TO THE PERCEPTIONS OF MOTHERS</b>						
Progress of breastfeeding at hospital	Satisfied	227	83.2	3.16	2.118	.477
	Unsatisfied	46	16.8	2.91	2.189	
Satisfied with breastfeeding partner support at 1 month	Yes	207	75.8	3.29	2.087	.165
	No	66	24.2	2.85	2.227	
Satisfied with breastfeeding family support at 1 month	Yes	196	71.8	3.27	2.051	.275
	No	77	28.2	2.94	2.235	
Satisfied with the infant's growth at 1 month	Very satisfied	199	81.9	3.28	2.050	.001**
	Satisfied	39	14.8	2.08	2.143	
	Unsatisfied	8	3.3	1.50	2.070	

## VARIABLES RELATED TO THE PSYCHOLOGICAL STATUS OF MOTHERS

Breastfeeding self-efficacy at Hospital	High	123	48.0	3.42	2.064	.041*
	Low	133	52.0	2.88	2.164	
Breastfeeding self-efficacy at 1 month	High	127	51.4	3.54	1.975	.003**
	Low	120	48.6	2.73	2.241	
Anxiety symptoms (STAI>40) in-hospital	No	233	90.0	3.18	2.063	.620
	Yes	26	10.0	2.92	2.481	
Anxiety symptoms (STAI) 1 month	No	221	88.0	3.22	2.093	.050*
	Yes	30	12.0	2.40	2.444	
Depression symptoms (EPDS>9) in-hospital	No	216	82.4	3.19	2.086	.488
	Yes	46	17.6	2.96	2.231	
Depression symptoms (EPDS>9)1 month	No	228	88.7	3.22	2.096	.008**
	Yes	29	11.3	2.10	2.350	
Comorbidity in-hospital	No	251	96.9	3.18	2.081	.291
	Yes	8	3.1	2.38	2.825	
Comorbidity 1 month	No	235	93.6	3.20	2.102	.016*
	Yes	16	6.4	1.88	2.500	

<sup>a</sup> in months; <sup>b</sup> Standard Deviation (SD)

\*Test t - Student: Dichotomous variables \* significant difference at 5%, \*\* significant difference at 1%

ANOVA test: Polychotomous variables \* significant difference at 5%; \*\* significant difference at 1%

Table 2. Variables associated with a shorter duration of exclusive breastfeeding among Havana women in the univariate analysis

VARIABLE	Crude ORs	Confidence interval 95%	
		Min	Max
Breastfeeding initiated within the first hour of birth			
Yes (reference)	1.0		
No	1.84	1.11	3.04
Infant's weight at birth			
< 3.3 kg	1.88	1.15	3.08
≥ 3.3 kg (reference)	1.0		
Pacifier's use at 1 month			
Yes	1.98	1.11	3.55
No (reference)	1.0		
Infant's growth satisfaction at 1 month			
Satisfied (reference)	1.0		
Unsatisfied	3.02	1.53	5.95
Breastfeeding self-efficacy at Hospital			
High (reference)	1.0		
Low	1.85	1.06	3.22
Breastfeeding self-efficacy at 1 month			
High (reference)	1.0		
Low	1.89	1.13	3.15
Maternal anxiety (STAI) 1 month			
Presence	2.93	1.33	6.46
No presence (reference)	1.0		
Maternal depression (Edinburgh) 1 month			
Presence	2.60	1.17	5.77
No presence (reference)	1.0		
Comorbidity 1 month			
Presence	3.73	1.27	10.92
No presence (reference)	1.0		

Table 3. Variables associated with a shorter duration of exclusive breastfeeding among Havana women in the multivariate logistic regression

Variable	Coefficient	E. T.	Sig	OR adjust	IC del 95%	
					Inferior	Superior
Unsatisfied with the infant's growth at 1 month	1.152	.426	.007	3.164	1.373	7.288
Birth weight < 3.3 kg	.641	.322	.047	1.898	1.010	3.569
Constant	-1.024	.245	.000	.359		