Dear Editor Professor Jane Noyes

Thank you for your comments and contributions. We would like to thank you for the attentive evaluation of our work and your insightful comments, which have helped us to improve the manuscript substantially.

All the modifications have been marked in red to make these revisions easier to follow.

We hope you find this new version of the paper interesting, and we look forward to hearing from you.

Yours sincerely,

Reviewer	Reviewer Comment	Author Response	Manuscript Changes
Editor	Thank you for resubmitting your manuscript. The amendments are acknowledged. Please address the suggested edits and comments of reviewer 2 to further strengthen the manuscript.	Thank you for taking our work into consideration. Reviewer 2's comments were addressed. Changes have been marked in red to highlight them.	Manuscript
1	The revision of the article adequately addresses the concerns that were previously raised. The statistical data analysis is sound and the findings and discussions suitably represent the analysis results	Thank you for your comment and your valuable time spent on our manuscript. It is important for the authors to obtain a positive evaluation from an external reviewer.	None
2	Line 28: unite the first two sentences for easy reading and avoid, "for example"	The change proposed in the introduction section has been made. Thank you for your comment.	Section: Introduction Page: 2
2	line 47: (Committee on Healthcare for Underserved Women, 2013) -Does any systematic review confirm this evidence?	Thank you for your comment. A new database search has been carried out, and new, up-to-date evidence has been found (systematic review with meta-analysis) that has been used to update the reference list.	Section: Introduction Page: 2
2	page:3 line 3 (Huang, Yao, Liu, & Luo, 2019). PLEASE REVIEW REFERENCE. THIS ARTICLE IS LOCAL AND NOT MONDIAL, SO DO NOT CONFIRM THE QUOTE	The bibliographical reference has been replaced. Thank you for your comment.	Section: Background Page: 3
2	Line 13: 2019). Many regions have diferente.. restructure the beginning of the sentence Line: There exist this	Thank you for the detection of this fault. The percentage has been reviewed and modified as needed.	Section: Background Page: 3

	information. Confirm please: Eastern Europe 33% (UNICEF, 2019).		
2	Line 24: level of education: Maternal information?	Thank you very much. The word "maternal" has been added as the reviewer suggested.	Section: Background Page: 3
2	Line 32: "Extant research has also largely ignored the impact of health literacy on breastfeeding practices (Tsai, Huang, & Lee" 100 copy	Thank you for this comment. Our intention has never been to plagiarize any author, but to highlight their words. The sentence has been reformulated as follows: The influence of health literacy (HL) on breastfeeding practices are yet to be explored by researchers (Tsai, Huang, & Lee, 2015)	Section: Background Page: 3
2	Line 35: Health literacy (HC) First apparition	Thank you. The initialism has been used in the previous sentence.	None
2	Page 4: Line 54: justify the choice of 4 months as the cutoff point and not the 6 recommended by WHO	Thank you for this note. In Spain, the figures for exclusive breastfeeding at 6 months have been reported to be lower than recommended. Specifically, some of the publications show a percentage of 16.8%. A commentary has been added to the text to clarify this aspect.	Section: The Study Page: 4
2	Page 7 Line 56: the Newest Vital Sign (NVS). Reference?	Reference has been added.	Section: The Study Page: 9
2	Page 13 Line: 33: previously reported (Poorman, Gazmararian, Elon, & Parker, 2014). IN ATLANTA, NO SPAIN	Thank you for this comment. A new literature search has been carried out. We have found very mixed results across the world, for example, 31% of adequate HL in Atlanta, 10% in Malaysia, 33.3 in black women in the north-eastern United States or 19.5% in Arizona. Thank you for giving us the opportunity to clarify this aspect.	Section: Discussion Page: 12

Health Literacy of Pregnant Women and Duration of Breastfeeding Maintenance: A Feasibility Study

Health Literacy and Breastfeeding Maintenance

ABSTRACT

Aims: Research the association between health literacy and exclusive breastfeeding at four-months postpartum.

Background: Despite the benefits of breastfeeding, its rates are low worldwide. Among the reasons for abandonment is the level of maternal education. Maternal education has been associated with health literacy, but evidence between health literacy and breastfeeding maintenance is limited.

Design: A cross-sectional study.

Methods: The sample compromised 229 nursing mothers recruited from January 2018 to the end of December 2018 at Spain by systematic sampling method. Women were interviewed postpartum on parameters associated with the start and continuation of breastfeeding up to four months postpartum. Multivariate logistic regression models to explain exposure variables as well as exclusive breastfeeding cessation at four months.

Results: Approximately 10% of the participants had inadequate health literacy. Factors associated with early cessation of exclusive breastfeeding at four months in the multivariate model adjusted using a stepwise variable selection process based on a likelihood ratio test were civil status, risk of pregnancy, type of delivery, limited or inadequate level of health literacy, and LATCH score at discharge, with an 85.6% area under the ROC curve.

Conclusions: Our study offers preliminary evidence regarding the hitherto inconsistent relation between health literacy and early cessation exclusive breastfeeding at four months, supporting the conduct of further studies with larger sample sizes and greater statistical power. Such studies are warranted before endorsing health literacy-based interventions aiming to mitigate early cessation exclusive breastfeeding.

Impact: Low or inadequate health literacy is linked to multiple poor health and clinical outcomes. We investigated the prevalence of exclusive breastfeeding at four months postpartum, and the impact of health literacy in maintaining optimal exclusive breastfeeding practices. Limited or inadequate health literacy was one of the factors associated with early cessation of exclusive breastfeeding in the multivariate regression model, although further research is needed.

KEYWORDS

health literacy, breastfeeding, breastfeeding duration, exclusive breastfeeding, nursing, breastfeeding abandonment, early cessation, women.

1. INTRODUCTION

Breastfeeding (BF) has long-term clinical benefits, it lowers the risk of infections and sudden infant death syndrome, childhood leukaemia, or obesity (Chan, Ip, & Choi, 2016). In turn, maternal benefits comprise improved bonding with the newborn infant, body weight stabilisation, lessened risk of postpartum depression, as well as a lower incidence of breast or ovarian malignancies (Abou-Dakn, 2018; Chowdhury et al., 2015). Lastly, BF affords both short and long term economic and environmental societal advantages (Rollins et al., 2016).

2. BACKGROUND

The World Health Organization recommend breastfeeding as the optimal feeding for all infants and exclusive breastfeeding (EBF) for the first 6 months of life; however, the rate of EBF within four months after delivery globally is still low (Victora et al., 2016). Despite these apparent benefits only about 36% of all infants are exclusively breastfed worldwide until approximately the age of six months (Victora et al., 2016; Vila-Candel, Soriano-Vidal, Murillo-Llorente, Pérez-Bermejo, & Castro-Sánchez, 2019). Many regions have different trends in the percentage of infants age 0 to 5 months exclusively breastfed, Eastern and Southern Africa 56%, South Asia 57%, North America 35%, and Eastern Europe and Central Asia 42% (UNICEF, 2019).

Several reasons for this early cessation have been identified, including hypogalactia, newborn weight gain below the recommendations, lower maternal age, low socioeconomic status, level of maternal education, breastfeeding knowledge, intention, and self-efficacy BF, an unsupportive working environment, and negative maternal expectations or experience with BF (Oribe et al., 2015; Ramiro González et al., 2018; Vila-Candel et al., 2019).

The influence of health literacy (HL) on breastfeeding practices are yet to be explored by researchers (Tsai, Huang, & Lee, 2015). The World Health Organization (WHO) defines HL as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (World Health Organization, 1998). A range of HL measurement tools are available (Kristine Sørensen et al., 2012). However, most tools do not reflect the multidimensional nature of HL, as they are predominantly focused on reading comprehension, pronunciation, and numeracy (Haun, Valerio, McCormack, Sørensen, & Paasche-Orlow, 2014). Low or inadequate HL is linked to poor health and clinical outcomes, including increased hospitalisations, emergency department use, poor

overall health status, and higher levels of mortality (Batterham, Hawkins, Collins, Buchbinder, & Osborne, 2016). Given the significant burden of low HL on citizens and users of the health and social care system (Castro-Sanchez, Vila-Candel, Soriano-Vidal, Navarro-Illana, & Diez-Domingo, 2018), on identifying and addressing this modifiable risk factor has been emphasised to improve health outcomes (Kilfoyle, Vitko, O'Conor, & Bailey, 2016). A factor that conditions behaviours that afford positive benefits towards BF is health literacy (HL) (Batterham et al., 2016; Castro-Sánchez, Chang, Vila-Candel, Escobedo, & Holmes, 2016).

Level of education has been associated with HL (Garcia-Codina et al., 2019; Kristine Sørensen et al., 2015), with clear evidence of the close and direct association between education level and health outcomes (Castro-Sanchez et al., 2018; Van Der Heide et al., 2013). However, low levels of HL were closely related to poorer health status, even in populations with high levels of education. Even though HL and its relationship with educational levels have not been clarified in previous literature (Van Der Heide et al., 2016), have strongly recommended that HL should be part of the equation to evaluate the manner in which health information is to be handled in the target population.

In view of the importance of maternal HL and BF, the definition of predictors and risk factors could make an essential contribution to improved maternal and infant health (Khorasani, Peyman, & Esmaily, 2017).

A limited number of studies have evaluated the relationship between maternal HL and BF behaviours. However, suggests a positive relationship between mother´s HL with the continuation of BF, with lower HL being associated to a limited duration of EBF (Barnes, Barclay, McCaffery, & Aslani, 2018; Kaufman, Skipper, Small, Terry, & McGrew, 2001).

3. THE STUDY

3.1 Aims

The present study was designed to investigate the association between health literacy and exclusive breastfeeding at four-months postpartum. The rate of exclusive breastfeeding at 6 months in Spain is very low, making it difficult to obtain a sufficient number of mothers for a robust analysis (Cabedo-Ferreiro et al., 2019).

Furthermore, to assess the prevalence of EBF at four months postpartum and identify the variables associated with low and high HL.

3.2 Design

This study used a descriptive, cross-sectional, questionnaire-based design.

3.3 Participants

The catchment area of the Health Department comprises of 251,000 inhabitants, with about 1700 births per year. La Ribera University Hospital is a state-funded tertiary hospital with 300 beds. The portfolio of health services offered to citizens in Spain depends on each of the 17 Autonomous Regions, and their ability to independently tailor health resources to the needs of the local population.

The population was defined as women in their postpartum period (24-48 hours after delivery) who were followed-up until their infants reached 4 months of age. We selected women in their postpartum period using a probability sampling with systematic monitoring. The research team selected to interview two women at random per week from those who were inpatient. Convenience sampling was performed, with the following inclusion criteria: (a) nursing mothers in their immediate postpartum period, (b) women without cognitive problems, language difficulties or those who were illiterate, and (c) single births at term in order to facilitate comparison with previous studies (Vila-Candel,

Castro-Sánchez, & Soriano-Vidal, 2017). Women could not be contacted in the telephone interview after three attempts were excluded during follow-up visits from the study.

During the first interview at the hospital, consent forms and personal contact information for further follow-up appointments were obtained from candidates who were willing to participate.

The sample size was estimated by EPIDAT 3.1 with the following settings: assuming a risk of attrition of EBF in the group of patients with adequate HL of 40% (Rius et al., 2014), versus 60% among patients with inadequate HL, with equally sized groups, a power of 85% and a 95% level of confidence. The calculated sample size required was 222 participants.

3.4 Data Collection

Data were collected from participants using a paper questionnaire. The researchers recruited convenience samples of women from hospital from January 2018 to the end of December 2018. The health literacy screening tool was self-administrated and took approximately 10 minutes to complete.

Feeding type was classified into exclusive breastfeeding including expressed milk or milk from a donor (Oribe et al., 2015; Winkvist et al., 2015) or formula feed, either alone or mixed (if feeding combined BF and formula feed). Breastfeeding status was recorded at the time of hospital discharge (48-72 hours), and at one, two, and four months postpartum. Early cessation of EBF was classified as cessation before four months postpartum (yes/no).

Subsequently, the community midwife at the health care centre, who already had two established postpartum control appointments with the mothers (at one, and two months postpartum), gathered information regarding their breastfeeding status. At four months postpartum, a telephone interview was conducted, chosen to minimise the risk of

missing data and maximise data accuracy, as this was the period where women scheduled an appointment with their paediatrician and the pediatric nurse responsible for the care of the newborn for routine immunisation.

3.5 Ethical considerations

The study adhered with the recommendations of the Declaration of Helsinki and was approved by the Clinical Research Ethics Committee of La Ribera University Hospital in November 2017 (HULR_11/2017/#43). All participants were fully informed about the study, the voluntary nature of participation, and confidentiality. The research team recruited the women at the hospital and written informed consent was obtained in all cases, and guaranteed anonymity and confidentiality.

3.6 Data analysis

Descriptive statistics were reported as means and standard deviations for continuous variables (age, age at first pregnancy, gestational age, birth weight, LATCH score, duration of BF), and as ranges and percentages for categorical variables.

The exposure variable of the literacy level measured by NVS was analysed categorically. The categories 'Inadequate' and 'Limited' were collapsed into a single category.

Regarding BF status from hospital discharge, the response variable "EBF cessation at 4 months" was divided into two categories: "EBF at 4 months" and "gives up BF at 4 months", which included either formula feeding or mixed feeding.

We analysed the level of HL with the NVS screening tools and the characteristics of the women who gave up breastfeeding at four months via 2x2 tables and the chi-squared test (χ^2) for qualitative variables. Moreover, the comparison of averages was made with the application of the Student *t*-test for quantitative variables. Likewise,

follow-up dropouts were analysed over the four months to determine any differences between groups.

To analyse the magnitude of the association between variables, we generated multivariate logistic regression models to explain exposure variables as well as EBF cessation at four months. These models were adjusted using a stepwise variable selection process based on a likelihood ratio (LR) test. The results present adjusted odds ratios (*OR*), confidence intervals (CIs) calculated for a confidence level of 95%, and associated *p*-values. Data analysis was performed on SPSS v.25.0 statistical package (IBM Corp. Released 2018. IBM SPSS Statistics for Windows, Armonk, NY, USA) and R (R project 2019, Version 3.5.1). Statistical significance was considered for $p < .05$.

3.7 Validity, reliability and rigour

Data collection included demographic characteristics and, health literacy evaluation tools. LATCH and, other gynaecological data were obtained from electronic medical records.

3.7.1 Early cessation of exclusive breastfeeding

In all routine visits, the mothers were asked about the early cessation of EBF and duration of EBF since their discharge from hospital (1.-Are you breastfeeding your baby without the help of any formula feeding? 2.- If not, for how long have you been exclusively breastfeeding your baby?). Finally, the information related to the type of feeding and duration was registered in the personal electronic medical health record.

3.7.2 Breastfeeding LATCH score

The breastfeeding LATCH score serves to predict EBF success up to 6 weeks postpartum (Sowjanya & Venugopalan, 2018) and provides a systematic method to gather information about individual BF sessions. LATCH score assigns a numerical score of 0, 1 or 2 to five key components of BF for a possible total score of 10 points: ‘‘L’’ is for how well the infant latches onto the breast, ‘‘A’’ is for the amount of audible swallowing

noted, ‘‘T’’ is for the mother’s nipple type/condition, ‘‘C’’ is for the mother’s level of comfort, and ‘‘H’’ is for the amount of help the mother needs to hold her infant to the breast (Jensen, Wallace, & Kelsay, 1994). LATCH score showed that correlations were strong and positive for each item and total LATCH score. The Spearman correlation coefficients ranged from 0.65 to 0.91 (Altuntas et al., 2014). We assessed the LATCH score in the maternity unit daily during admission and included it in our data upon discharge (Tornese et al., 2012).

3.7.3 Health literacy screening tool

The HL was explored through an interview at discharge using the Newest Vital Sign (NVS) (Weiss et al., 2005). This tool explores reading and numeracy using a set of 6 questions based on an ice-cream’s nutritional information label to the respondent. Participants were not briefed about the type of answer expected nor was extra time provided. The total score (0 to 6 points) categorises individuals as having a strong probability of limited literacy (score: 0-1 points), possible limited literacy (score: 2-3 points) or adequate literacy (score: 4-6 points) as per authors instructions. NVS scale has also been validated for the Spanish speaking population, with moderate reliability (Cronbach $\alpha = .69$).

4. RESULTS

4.1 Demographic characteristics

Regarding the sociodemographic characteristics of the participants, the mean (SD) age was 32.5 (5.2) years. At table 1 can be found details of the distribution according to the HL screening tool used. The mean (SD) LATCH score on the day of discharge in women with EBF and mixed breastfeeding was 8.95 (0.95). A third (38.8%, $n = 89$) of the women

planned to use formula feeding immediately after delivery, as the only continued type of feeding.

A total of 278 women were initially selected through the inclusion criteria for the study. Two hundred and twenty-nine mothers completed the interviews at discharge (82.3%) and 187 mothers at infant age 4 months (65.1%), as presented in Figure 1. We analysed the homogeneity among those who agreed, and those who declined to participate. There were no significant differences in age, age at first pregnancy, gestational age at delivery, or country of origin between the group that accepted and the group that declined to participate.

Regarding the women lost to follow-up, statistically significant reductions in the sample population were recorded at one, two and four months among the participants with lower educational status (p = .011; p = .017; p = .019, respectively) and lower HL levels as measured by the NVS (p = .019; p = .035; p = .016, respectively), presented in Figure 2.

4.2 Prevalence of exclusive breastfeeding

The time course of EBF over follow-up is presented in Figure 3. The prevalence of EBF at the time of hospital discharge was 55.0%, 95% CI [48.5-61.4] versus 46.0%, 95% CI [26.5-38.6] at one month, 39.0%, 95% CI [20.8-32.2] at two months, and 25.6%, 95% CI [16.1-26.6] at four months. In turn, 48.3%, 95% CI [14.1-24.2] of the women showed early cessation of EBF.

4.3 Variables related to health literacy

The NVS screening tool yielded scores between 0 and 6. These scores were categorized as indicative of inadequate (9.6%, n=22), limited (45.4%, n = 104), and adequate HL (45%, n = 103).

Table 1 presents the results obtained with the HL levels analysed in relation to the NVS tool (Adequate/Inadequate or Limited). We identified statistically significant differences in terms of the level of education ($p < .001$) and maternal employment ($p < .001$). The multivariate logistic regression model for inadequate or limited HL suggested that level of education and maternal employment were associated with limited or inadequate HL. In addition, maternal age was identified as a confounding variable. Women who were unemployed or currently studying were more likely to have inadequate HL as compared to self-employed/higher professional/managerial employed women, all presented in Table 2.

4.4 Variables related to early cessation of exclusive breastfeeding at four months

On considering the characteristics of the women and the referred early cessation of EBF before four months, we observed statistically significant differences in the multivariate logistic regression model performed (n= 88). The area under the ROC curve for early cessation of breastfeeding was .856 (95% CI [.777-.935]; $p < .001$). Regarding the quantitative variables, only the BF LATCH score at discharge was associated to early cessation of EBF ($p = .002$), with a higher average score 9.3, (SD 0.64) *vs.* 8.7 (SD 1.01) among the women who stopped EBF. Civil status ($p = .001$), risk of pregnancy ($p = .002$), and type of delivery ($p = .018$) were associated with cessation. The HL level as per the NVS tool was not statistically significative with the early cessation of EBF but the association was high (OR= 2.6; 95% CI [.837-8.553]; $p = .097$) and clinically relevant, as presented in Table 3.

5. DISCUSSION

This is one of the most comprehensive studies published to date in Spain on breastfeeding initiation, maintenance, and predisposing factors for EBF at four months postpartum, and on the overall influence of HL upon these behaviours. Based on the results of the present

study, even though there was no significant relationship between the levels of HL of nursing mothers with the EBF at four months, although their association could be plausible.

The prevalence of EBF at four months was slightly higher than what was reported previously in Spain (Rodríguez-Pérez et al., 2017), although lower than in other cohorts in northern Spain (51.4-62.5%) (Oribe et al., 2015; Ramiro González et al., 2018). These differences could be attributable to the methodologies used for data collection, or the scope of breastfeeding policies of the different organisations (Díaz-Gómez, Ruzafa-Martínez, Ares, Espiga, & De Alba, 2016). Additionally, we need to consider the impact of follow-up losses on the true prevalence of EBF.

In our study, over one-half of all the women were using formula feeding at four months. It could, therefore, be inferred that a 13.5% of the women had opted for formula feeding due to EBF failure, and this was in line with our previous study (Vila-Candel, Duke, Soriano-Vidal, & Castro-Sánchez, 2018). While breastfeeding initiation rate was high, the continuation rate declined subsequently. The EBF rate was still sub-optimal and do not meet the global public health recommendation set by WHO, and this may indicate that additional measures are needed (De Roza et al., 2019).

Health literacy has been identified as a critical and modifiable factor to improve health outcomes and reduce health disparities (Hoffman, Marsiglia, Nevarez, & Porta, 2017). We found that while the NVS tool classified 45% of the women as having adequate HL, this figure was higher than previously reported across the board (Cheong et al., 2018; Gazmararian, Yang, Elon, Graham, & Parker, 2012; Komenaka et al., 2015; Poorman, Gazmararian, Elon, & Parker, 2014). Factors associated with HL were level of education and employment status. Since education is a crucial HL predictor, this could explain the relatively weak discriminating capacity of the NVS scale (Delanoë et al., 2016). In

general, low HL was also correlated with lower socioeconomic or employment status (K Sørensen et al., 2013). Accordingly, mothers with a higher education level tended to initiate BF more often and were likely to breastfeed for a more extended period of time, compared to their less-educated counterparts (Ramiro González et al., 2018; Whipps, 2017). Thus, our findings confirm the existence of relationships between educational level and HL, as per other studies (Van Der Heide et al., 2013).

Among the women opting for early cessation of EBF, about half had limited or inadequate HL according to the NVS. Some authors have reported that 30% of women with inadequate HL have never breastfed, as compared to 13% of women with adequate HL (Poorman et al., 2014). Other studies based on the REALM (Rapid Estimate of Adult Literacy in Medicine) tool have concluded that a high HL is associated with EBF at two months (Kaufman et al., 2001), and with a significantly high likelihood of BF continuation at postpartum (Stafford, Lathrop, & Haddad, 2016). Other authors have observed an association between maternal HL and BF self-efficacy (Khorasani et al., 2017). Furthermore, no significant relationship between HL levels and BF pattern has been reported as per other studies (Mirjalili, Jaberi, Jaberi, & Bonabi, 2018).

In this work, single, separated, divorced or widowed women, at risk in pregnancy, with limited or inadequate HL, with spontaneous delivery and with low LATCH values at discharge were associated with the early cessation of EBF at four months. In our study, a stable relationship was associated with more extended periods of BF and was attributed to partner support of BF. This support has been previously associated with increased rates of initiation and duration of BF (Leng, Shorey, Yin, Chan, & He, 2019; Rempel, Rempel, & Moore, 2017).

Besides, women at increased antenatal obstetric risk were less likely to opt for EBF at four months. The underlying reasons could be clinical or psychological, as seen

in limited EBF and assisted reproduction (Barrera, Kawwass, Boulet, Nelson, & Perrine, 2019), or hypertensive pregnancy disorder (Groer, Jevitt, Sahebzamani, Beckstead, & Keefe, 2013). Nevertheless, the observation could be related to increased levels of anxiety, resulting in a shortened EBF period (Ystrom, 2012).

Several studies have confirmed that birth by cesarean section significantly hinders BF within the first hour of life (Hobbs, Mannion, McDonald, Brockway, & Tough, 2016). However, mothers who successfully start BF after a cesarean section procedure are as likely to continue EBF at 6 months, as compared to mothers who give birth via vaginal delivery (Kiani, Rich, Herkert, Safon, & Pérez-Escamilla, 2018; Lau, Htun, Lim, Ho-Lim, & Klainin-Yobas, 2015).

Regarding HL levels, women with higher scores could have increased awareness of the importance of BF, have better access to resources, or be surrounded by other women who would help them address difficulties (Díaz-Gómez et al., 2016; Vila-Candel et al., 2017). This seems to support our hypothesis, as women with low HL have lower EBF rate at four months postpartum than women with adequate HL.

We analysed the HL and sociodemographic characteristics of women who were lost to follow-up. Women with lower educational and HL levels were at a higher risk of dropping out of abandoning the study. Healthcare professionals should thus tailor local resources to support these women. The use of tools including the LATCH score at discharge or HL screening questionnaires before delivery (Tornese et al., 2012), could identify women who may be more hesitant to access health services or seek specialised professional help (Soriano-Vidal, Vila-Candel, Soriano-Martín, Tejedor-Tornero, & Castro-Sánchez, 2018).

5.1 Limitations

Our results related to EBF, while far from excellent, improve upon other comparable studies (Oribe et al., 2015; Rius et al., 2014). Nevertheless, our study has limitations. Firstly, regarding the multivariate model constructed to determine the factors that explain the early cessation EBF, only 88 subjects could be included in the model. This size to build a model that identifies effects between variables is scarce. Secondly, the magnitude of the OR obtained should be considered in the light of the limited sample size, corresponding to women with low HL and early cessation of EBF. This could have led to overestimating the likelihood of EBF cessation. However, factors associated with cessation would not be influenced by this limitation.

On the other hand, we pragmatically selected and used NVS tool based on their soundness and experience. While there are more than 40 tools available, there is still a paucity of HL research conducted in Spain (Karnoe & Kayser, 2015), with no tools validated in this country. The only validated tools to date are referred to Spanish-speaking Hispanics (Lee, Stucky, Lee, Rozier, & Bender, 2010; Weiss et al., 2005). In these cases, some authors recommended adjusted linguistic validation procedures. Unfortunately, such validation has been made for Spanish spoken in Spain, with no transcultural validation or adaptation to the pregnant women (Acquadro, Conway, Hareendran, & Aaronson, 2008).

6. CONCLUSION

Multiple well-known bio-psycho-social and economic factors influence decisions about breastfeeding, such determinants should already be considered by breastfeeding support and promotion programs.

Our study offers preliminary evidence regarding the hitherto inconsistent relation between HL and early cessation EBF at four months, supporting the conduct of further

studies with larger sample sizes and greater statistical power. Such studies are warranted before endorsing health literacy-based interventions aiming to mitigate early cessation EBF. On the other hand, health literacy would contribute to and promote person-centred maternity health care and would result in multiple other benefits for women and infants.

ANONYMISED CONFLICT OF INTEREST STATEMENT

The authors have declared no conflict of interest.

REFERENCES

Abou-Dakn, M. (2018). Gesundheitliche Auswirkungen des Stillens auf die Mutter (Health effects of breastfeeding on the mother). *Leitthema*, *61*(8), 986–989. https://doi.org/https://doi.org/10.1007/s00103-018-2776-1

Acquadro, C., Conway, K., Hareendran, A., & Aaronson, N. (2008). Literature review of methods to translate health-related quality of life questionnaires for use in multinational clinical trials. *Value in Health*, *11*(3), 509–521. https://doi.org/10.1111/j.1524-4733.2007.00292.x

Altuntas, N., Turkyilmaz, C., Yildiz, H., Kulali, F., Hirfanoglu, I., Onal, E., … Atalay, Y. (2014). Validity and reliability of the infant breastfeeding assessment tool, the mother baby assessment tool, and the LATCH scoring system. *Breastfeeding Medicine*, *9*(4), 191–195. https://doi.org/10.1089/bfm.2014.0018

Barnes, L. A. J., Barclay, L., McCaffery, K., & Aslani, P. (2018). Complementary medicine products: Information sources, perceived benefits and maternal health literacy. *Women and Birth*, *32*(6), 493–520.

https://doi.org/10.1016/j.wombi.2018.11.015

Barrera, C. M., Kawwass, J. F., Boulet, S. L., Nelson, J. M., & Perrine, C. G. (2019). Fertility treatment use and breastfeeding outcomes. *American Journal of Obstetrics and Gynecology*, *220*(3), 261.e1-261.e7. https://doi.org/10.1016/j.ajog.2018.11.1100

Batterham, R. W., Hawkins, M., Collins, P. A., Buchbinder, R., & Osborne, R. H. (2016). Health literacy: Applying current concepts to improve health services and reduce health inequalities. *Public Health*, *132*, 3–12. https://doi.org/10.1016/j.puhe.2016.01.001

Cabedo-Ferreiro, R., Manresa-Domínguez, J. M., Cambredo, M. V., Montero-Pons, L., Reyes, A., Gol, R., & Falguera, G. (2019). Tipos de lactancia materna y factores que influyen en su abandono hasta los 6 meses . Estudio LACTEM. *Matronas Prof*, *20*(2), 54–61. Retrieved from https://www.federacion-matronas.org/revista/wp-content/uploads/2019/05/54-ORIGINAL-TIPOS-LACTANCIA.pdf

Castro-Sánchez, E., Chang, P. W. S., Vila-Candel, R., Escobedo, A. A., & Holmes, A. H. (2016). Health literacy and infectious diseases: why does it matter? *International Journal of Infectious Diseases*, *43*, 103–110. https://doi.org/10.1016/j.ijid.2015.12.019

Castro-Sanchez, E., Vila-Candel, R., Soriano-Vidal, F. J., Navarro-Illana, E., & Diez-Domingo, J. (2018). Influence of health literacy on acceptance of influenza and pertussis vaccinations: a cross-sectional study among Spanish pregnant women. *BMJ Open*, *8*(7), e022132. https://doi.org/10.1136/bmjopen-2018-022132

Chan, M. Y., Ip, W. Y., & Choi, K. C. (2016). The effect of a self-efficacy-based educational programme on maternal breast feeding self-efficacy, breast feeding duration and exclusive breast feeding rates: A longitudinal study. *Midwifery*, *36*, 92–98. https://doi.org/10.1016/j.midw.2016.03.003

Cheong, S. M., Mohamad Nor, N. S., Ahmad, M. H., Manickam, M., Ambak, R., Shahrir, S. N., & Aris, T. (2018). Improvement of health literacy and intervention measurements among low socio-economic status women: Findings from the MyBFF@home study. *BMC Women's Health*, *18*(Suppl 1), 99. https://doi.org/10.1186/s12905-018-0596-y

Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., … Martines, J. (2015). Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatrica*, *104*(467), 96–113. https://doi.org/10.1111/apa.13102

De Roza, M. J. G., Fong, M. M. K., Ang, M. B. L., Sadon, M. R. B., Koh, M. E. Y. L., & Teo, M. S. S. H. (2019). Exclusive breastfeeding, breastfeeding self-efficacy and perception of milk supply among mothers in Singapore: A longitudinal study. *Midwifery*. https://doi.org/10.1016/j.midw.2019.102532

Delanoë, A., Lépine, J., Leiva Portocarrero, M. E., Robitaille, H., Turcotte, S., Lévesque, I., … Légaré, F. (2016). Health literacy in pregnant women facing prenatal screening may explain their intention to use a patient decision aid: a short report. *BMC Research Notes*, *9*(1), 339. https://doi.org/10.1186/s13104-016-2141-0

Díaz-Gómez, N., Ruzafa-Martínez, M., Ares, S., Espiga, I., & De Alba, C. (2016). Motivations and Perceived Barriers to Initiate or Sustain Breastfeeding among

Spanish Women. *Rev Esp Salud Pública*, *90*, e1-18.

Garcia-Codina, O., Juvinyà-Canal, D., Amil-Bujan, P., Bertran-Noguer, C., González-Mestre, M. A., Masachs-Fatjo, E., … Saltó-Cerezuela, E. (2019). Determinants of health literacy in the general population: results of the Catalan health survey. *BMC Public Health*, *19*(1), 1122. https://doi.org/10.1186/s12889-019-7381-1

Gazmararian, J. A., Yang, B., Elon, L., Graham, M., & Parker, R. (2012). Successful enrollment in text4baby more likely with higher health literacy. *Journal of Health Communication*, *17*(Suppl 3), 303–311. https://doi.org/10.1080/10810730.2012.712618

Groer, M. W., Jevitt, C. M., Sahebzamani, F., Beckstead, J. W., & Keefe, D. L. (2013). Breastfeeding Status and Maternal Cardiovascular Variables Across the Postpartum. *Journal of Women's Health*, *22*(5), 453–459. https://doi.org/10.1089/jwh.2012.3981

Haun, J. N., Valerio, M. A., McCormack, L. A., Sørensen, K., & Paasche-Orlow, M. K. (2014). Health literacy measurement: An inventory and descriptive summary of 51 instruments. *Journal of Health Communication*, *19*(sup2), 302–333. https://doi.org/10.1080/10810730.2014.936571

Hobbs, A. J., Mannion, C. A., McDonald, S. W., Brockway, M., & Tough, S. C. (2016). The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC Pregnancy and Childbirth*, *16*, 90. https://doi.org/10.1186/s12884-016-0876-1

Hoffman, S., Marsiglia, F. F., Nevarez, L., & Porta, M. (2017). Health Literacy among Youth in Guatemala City. *Social Work in Public Health*, *32*(1), 30–37.

https://doi.org/10.1080/19371918.2016.1188741

Jensen, D., Wallace, S., & Kelsay, P. (1994). LATCH: A Breastfeeding Charting System and Documentation Tool. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, *23*(1), 27–32. https://doi.org/10.1111/j.1552-6909.1994.tb01847.x

Karnoe, A., & Kayser, L. (2015). How is eHealth literacy measured and what do the measurements tell us? A systematic review. *Knowledge Management and E-Learning*, *7*(4), 576–600.

Kaufman, H., Skipper, B., Small, L., Terry, T., & McGrew, M. (2001). Effect of Literacy on Breast-feeding Outcomes. *Southern Medical Journal*, *94*(3), 293–296. https://doi.org/10.1097/00007611-200103000-00005

Khorasani, E. C., Peyman, N., & Esmaily, H. (2017). Relations between breastfeeding self-efficacy and maternal health literacy among pregnant women. *Evidence Based Care Journal*, *6*(4), 18–25. https://doi.org/10.22038/ebcj.2016.7986

Kiani, S. N., Rich, K. M., Herkert, D., Safon, C., & Pérez-Escamilla, R. (2018). Delivery mode and breastfeeding outcomes among new mothers in Nicaragua. *Maternal and Child Nutrition*, *14*(1). https://doi.org/10.1111/mcn.12474

Kilfoyle, K. A., Vitko, M., O'Conor, R., & Bailey, S. C. (2016). Health Literacy and Women's Reproductive Health: A Systematic Review. *Journal of Women's Health (2002)*, *25*(12), 1237–1255. https://doi.org/10.1089/jwh.2016.5810

Komenaka, I. K., Nodora, J. N., Hsu, C. H., Martinez, M. E., Gandhi, S. G., Bouton, M. E., … Weiss, B. D. (2015). Association of health literacy with adherence to screening mammography guidelines. *Obstetrics and Gynecology*, *125*(44), 852–859. https://doi.org/10.1097/AOG.0000000000000708

Lau, Y., Htun, P., Lim, P. I., Ho-Lim, S., & Klainin-Yobas, P. (2015). Maternal, infant characteristics, breastfeeding techniques, and initiation: Structural equation modeling approaches. *PLoS ONE*, *10*(11), e0142861. https://doi.org/10.1371/journal.pone.0142861

Lee, S.-Y. D., Stucky, B. D., Lee, J. Y., Rozier, R. G., & Bender, D. E. (2010). Short Assessment of Health Literacy-Spanish and English: a comparable test of health literacy for Spanish and English speakers. *Health Services Research*, *45*(4), 1105–1120. https://doi.org/10.1111/j.1475-6773.2010.01119.x

Leng, R. N. W., Shorey, S., Yin, S. L. K., Chan, C. P. P., & He, H.-G. (2019). Fathers' Involvement in Their Wives'/Partners' Breastfeeding: A Descriptive Correlational Study. *Journal of Human Lactation*, *35*(4), 801–812. https://doi.org/10.1177/0890334419830988

Mirjalili, N., Jaberi, A. A., Jaberi, K. A., & Bonabi, T. N. (2018). The role of maternal health literacy in breastfeeding pattern. *Journal of Nursing & Midwifery Sciences*, *5*(2), 53–58. https://doi.org/10.4103/JNMS.JNMS_21_18

Oribe, M., Lertxundi, A., Basterrechea, M., Begiristain, H., Santa Marina, L., Villar, M., … Ibarluzea, J. (2015). [Prevalence of factors associated with the duration of exclusive breastfeeding during the first 6 months of life in the INMA birth cohort in Gipuzkoa]. *Gaceta Sanitaria*, *29*(1), 4–9. https://doi.org/10.1016/j.gaceta.2014.08.002

Poorman, E., Gazmararian, J., Elon, L., & Parker, R. (2014). Is health literacy related to health behaviors and cell phone usage patterns among the text4baby target population? *Archives of Public Health*, *72*(1). https://doi.org/10.1186/2049-3258-72-13

Ramiro González, M. D., Ortiz Marrón, H., Arana Cañedo-Argüelles, C., Esparza Olcina, M. J., Cortés Rico, O., Terol Claramonte, M., & Ordobás Gavín, M. (2018). Prevalence of breastfeeding and factors associated with the start and duration of exclusive breastfeeding in the Community of Madrid among participants in the ELOIN. *Anales de Pediatria*, *89*(1), 32–43. https://doi.org/10.1016/j.anpedi.2017.09.002

Rempel, L. A., Rempel, J. K., & Moore, K. C. J. (2017). Relationships between types of father breastfeeding support and breastfeeding outcomes. *Maternal and Child Nutrition*, *13*(3), 1–14. https://doi.org/10.1111/mcn.12337

Rius, J. M., Ortuño, J., Rivas, C., Maravall, M., Calzado, M. a, López, A., … Vento, M. (2014). [Factors associated with early weaning in a Spanish region]. *Anales de Pediatría*, *80*(1), 6–15. https://doi.org/10.1016/j.anpedi.2013.05.011

Rodríguez-Pérez, M. J., Álvarez-Vázquez, E., Medina-Pomares, J., Velicia-Peñas, C. V.-P., Cal-Conde, A., Goicoechea-Castaño, A., … Clavería, A. (2017). [Prevalence of BreastFeeding in a Galician Health Area, Spain]. *Revista Espanola de Salud Publica*, *91*, e201702017.

Rollins, N. C., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C. K., Martines, J. C., … Victora, C. G. (2016). Why invest, and what it will take to improve breastfeeding practices? *The Lancet*, *387*(10017), 491–504. https://doi.org/10.1016/S0140-6736(15)01044-2

Sørensen, K, Van den Broucke, S., Pelikan, J. M., Fullam, J., Doyle, G., Slonska, Z., … Brand, H. (2013). Measuring health literacy in populations: illuminating the design and development process of the European Health Literacy Survey Questionnair (HLS-EU-Q). *BMC Public Health*, *13*(1), 948. https://doi.org/10.1186/1471-2458-

13-948

Sørensen, Kristine, Pelikan, J. M., Röthlin, F., Ganahl, K., Slonska, Z., Doyle, G., … Helmut Brand. (2015). Health literacy in Europe: Comparative results of the European health literacy survey (HLS-EU). *European Journal of Public Health*, *25*(6), 1053–1058. https://doi.org/10.1093/eurpub/ckv043

Sørensen, Kristine, Van Den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: A systematic review and integration of definitions and models. *BMC Public Health*, *12*, 80. https://doi.org/10.1186/1471-2458-12-80

Soriano-Vidal, F. J., Vila-Candel, R., Soriano-Martín, P. J., Tejedor-Tornero, A., & Castro-Sánchez, E. (2018). The effect of prenatal education classes on the birth expectations of Spanish women. *Midwifery*, *60*, 41–47. https://doi.org/10.1016/j.midw.2018.02.002

Sowjanya, S. V. N. S., & Venugopalan, L. (2018). LATCH score as a predictor of exclusive breastfeeding at 6 weeks postpartum: A prospective cohort study. *Breastfeeding Medicine*, *13*(6), 444–449. https://doi.org/10.1089/bfm.2017.0142

Stafford, J. D., Lathrop, E., & Haddad, L. (2016). Health Literacy and Associated Outcomes in the Postpartum Period at Grady Memorial Hospital [2H]. *Obstetrics & Gynecology*, *127*(p 66s-67s). https://doi.org/10.1097/01.AOG.0000483913.45246.45

Tornese, G., Ronfani, L., Pavan, C., Demarini, S., Monasta, L., & Davanzo, R. (2012). Does the LATCH score assessed in the first 24 hours after delivery predict non-exclusive breastfeeding at hospital discharge? *Breastfeeding Medicine*, *7*(6), 423–

430. https://doi.org/10.1089/bfm.2011.0120

Tsai, T. I., Huang, S. H., & Lee, S. Y. D. (2015). Maternal and Hospital Factors Associated with First-Time Mothers' Breastfeeding Practice: A Prospective Study. *Breastfeeding Medicine*, *10*(6). https://doi.org/10.1089/bfm.2015.0005

UNICEF. (2019). Infant and young child feeding. Retrieved from https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/

Van Der Heide, I., Uiters, E., Sørensen, K., Röthlin, F., Pelikan, J., Rademakers, J., & Boshuizen, H. (2016). Health literacy in Europe: The development and validation of health literacy prediction models. *European Journal of Public Health*, *26*(6), 906–911. https://doi.org/10.1093/eurpub/ckw078

Van Der Heide, I., Wang, J., Droomers, M., Spreeuwenberg, P., Rademakers, J., & Uiters, E. (2013). The relationship between health, education, and health literacy: Results from the dutch adult literacy and life skills survey. *Journal of Health Communication*, *18*(SUPPL. 1), 172–184. https://doi.org/10.1080/10810730.2013.825668

Victora, C. G., Bahl, R., Barros, A. J. D., Fran??a, G. V. A., Horton, S., Krasevec, J., … Rollins, N. C. (2016). Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *The Lancet*, *387*(10017), 475–490. https://doi.org/10.1016/S0140-6736(15)01024-7

Vila-Candel, R., Castro-Sánchez, E., & Soriano-Vidal, F. J. (2017). What are the main reasons for visiting a blog which contains pregnancy, childbirth and breastfeeding information? *Matronas Profesion*, *18*(2), 32e-38e. Retrieved from http://www.federacion-matronas.org/revista/matronas-

profesion/sumarios/i/20507/173/cuales-son-los-principales-motivos-de-consulta-de-un-blog-relacionado-con-el-embarazo-el-parto-y-la-lactancia-disponible

Vila-Candel, R., Duke, K., Soriano-Vidal, F. J., & Castro-Sánchez, E. (2018). Affect of Early Skin-to-Skin Mother–Infant Contact in the Maintenance of Exclusive Breastfeeding: Experience in a Health Department in Spain. *Journal of Human Lactation*, *34*(2), 304–312. https://doi.org/10.1177/0890334416676469

Vila-Candel, R., Soriano-Vidal, F. J., Murillo-Llorente, M., Pérez-Bermejo, M., & Castro-Sánchez, E. (2019). Maintenance of exclusive breastfeeding after three months postpartum: An experience in a health department of a Valencian Community. *Atencion Primaria*, *51*(2), 91–98. https://doi.org/10.1016/j.aprim.2017.09.002

Weiss, B. D., Mays, M. Z., Martz, W., Castro, K. M., DeWalt, D. A., Pignone, M. P., … Hale, F. A. (2005). Quick assessment of literacy in primary care: The newest vital sign. *Annals of Family Medicine*, *3*(6), 514–522. https://doi.org/10.1370/afm.405

Whipps, M. D. M. (2017). Education Attainment and Parity Explain the Relationship between Maternal Age and Breastfeeding Duration in U.S. Mothers. *Journal of Human Lactation*, *33*(1), 220–224. https://doi.org/10.1177/0890334416679385

Winkvist, A., Brantsaeter, A. L., Brandhagen, M., Haugen, M., Meltzer, H. M., & Lissner, L. (2015). Maternal Prepregnant Body Mass Index and Gestational Weight Gain Are Associated with Initiation and Duration of Breastfeeding among Norwegian Mothers. *J Nutr*, *145*(6), 1263–1270. https://doi.org/10.3945/jn.114.202507

World Health Organization. (1998). *The WHO Health Promotion Glossary*. *World*

Health Organization. https://doi.org/10.1093/heapro/13.4.349

Ystrom, E. (2012). Breastfeeding cessation and symptoms of anxiety and depression: a longitudinal cohort study. *BMC Pregnancy and Childbirth*, *12*(1), 36. https://doi.org/10.1186/1471-2393-12-36

Table 1. Characteristics of the Study Sample According to the Health Literacy Screening Tool (NVS) (*N*=229).

		NVS			
Characteristics	**Total row *n***	**Adequate *n* (%)**	**Limited or inadequate *n* (%)**	**χ^2, *df*[a]**	***p*-value**
Civil status (n=228)				2.9, 1	.087
With partner/separated/divorced	74	32 (43.2)	42 (56.8)		
Married	154	89 (57.8)	65 (42.2)		
Level of education				41.4, 2	< .001
Primary school	84	19 (22.6)	65 (77.4)		
Secondary school	90	41 (45.6)	49 (54.4)		
University	55	43 (78.2)	12 (21.8)		
Employment status				22.5, 2	< .001
Self-employment/Higher professional/Managerial employment	22	13 (59.1)	9 (40.9)		
Employee	132	73 (55.3)	59 (44.7)		
Student/Unemployed	75	17 (22.7)	58 (77.3)		
Country of origin				2.3, 1	.126
Spain	211	98 (46.4)	113 (53.6)		
Foreign	18	5 (27.8)	13 (72.2)		
Partner employment status				2.4, 2	.301
Self-employment/Higher professional/Managerial employment	32	17 (53.1)	15 (46.9)		
Employee	175	79 (45.1)	96 (54.9)		
Student/Unemployed	22	7 (31.8)	15 (68.2)		
Parity				.3, 1	.553
Nulliparous	124	58 (46.8)	66 (53.2)		

Multiparous	105	45 (42.9)	60 (57.1)		
Medical risk factors during pregnancy				5.1, 2	.075
None/Low risk	181	87 (48.1)	94 (51.9)		
Pre-gestational/gestational diabetes/Pre-eclampsia	22	5 (22.7)	17 (77.3)		
Thyroid pathology/ART[b]	26	11 (42.3)	15 (57.7)		
Type of delivery (n=168)				2.3, 2	.310
Eutocic	91	44 (48.4)	47 (51.6)		
Instrumented	37	23 (62.2)	14 (37.8)		
Urgent cesarean section	40	23 (57.5)	17 (42.5)		
Type of breastfeeding at discharge (N=229)				2.7, 2	.259
EBF[c]	126	62 (49.2)	64 (50.8)		
Formula feeding	89	34 (38.2)	55 (61.8)		
Mixed feeding	14	7 (50.0)	7 (50.0)		
Type of breastfeeding at 1 month (*n*=198)[d]				10.7, 2	.005
EBF[c]	74	47 (63.5)	27 (36.5)		
Formula feeding	100	39 (39.0)	61 (61.0)		
Mixed feeding	24	10 (41.7)	14 (58.3)		
Type of breastfeeding at 2 months (*n*=191)[e]				13.6, 2	.001
EBF[c]	60	41 (68.3)	19 (31.7)		
Formula feeding	110	43 (39.1)	67 (60.9)		
Mixed feeding	21	9 (42.9)	12 (57.1)		
Type of breastfeeding at 4 months (*n*=187)[f]				9.7, 2	.007
EBF[c]	48	32 (66.7)	16 (33.3)		
Formula feeding	120	49 (40.8)	71 (59.2)		
Mixed feeding	19	11 (57.9)	8 (42.1)		
EBF[c] cessation at 4 months					

No	46	32 (69.6)	14 (30.4)	3.9, 1	.046
Yes	43	21 (48.8)	22 (51.2)		

[a] χ^2, *df*: Chi-square test, degrees of freedom.

[b] ART: assisted reproductive technology.

[c] EBF: exclusive breastfeeding.

[d] Lost to follow-up at 1 month=31.

[e] Lost to follow-up at 2 months=38.

[f] Lost to follow-up at 4 months=42.

Table 2. Odds Ratios and 95% Confidence Intervals of the Multivariate Logistic Regression Analysis of Factors Related to Inadequate Health Literacy (NVS).

	NVS[a]	
Factors	***OR* (95% CI)**	***p*-value**
Age	1.037 (.974-1.105)	.252
Civil status	-	
With partner/separated/divorced		
Married		
Level of education		
Primary school	1	
Secondary school[b]	0.393 (.194-.797)	.01
University[b]	0.085 (.035-.207)	< .001
Employment status		
Self-employment/Higher professional/Managerial employment/Employee	1	
Student/Unemployed	3723 (1.854-7.475)	< .001
Country of origin	**-**	
Spain		
Foreign[b]		

[a]Area under the ROC curve for inadequate health literacy according to NVS = .775, 95% CI [.715-.834]; χ^2=58.774; $p < .001$; n=126.

[b]Variable differs significantly between type of health literacy at $P < .05$.
Adjusted odds ratio calculated using the stepwise selection method based on the likelihood ratio test.

Table 3. Odds Ratios and 95% Confidence Intervals of the Multivariate Logistic Regression Analysis of Factors Related to Early Cessation of Breastfeeding at Four Months (*n*=88).

Factors	*OR* (95% CI)	*p*-value
LATCH[a] score[b]	.321 (.155-.666)	.002
Civil status		
With partner/separated/divorced	1	
Married[b]	.105 (.028-.392)	.001
Medical risk factors during pregnancy		
None/Low risk	1	
High risk[b]	19.017 (3.056-118.342)	.002
NVS categories		
Adequate	1	
Limited or Inadequate	2.675 (.837-8.553)	.097
Type of delivery		
Eutocic	1	
Instrumented	.397 (.106-1.487)	.171
Urgent cesarean section†	.154 (.033-.724)	.018

[a]LATCH: LATCH assessment tool.

[b]Variable differs significantly between type of feeding at 4 months at $p < .05$.

Adjusted odds ratio calculated using the stepwise selection method based on the likelihood ratio test.

Area under the ROc curve for early cessation of breastfeeding = .856, 95% ci [.777-.935]; χ^2=40.650; $p < .001$; n=88.

Analysis carried out on 88 participants with information on all variables. 1 participant excluded from analysis due to incomplete data civil status.

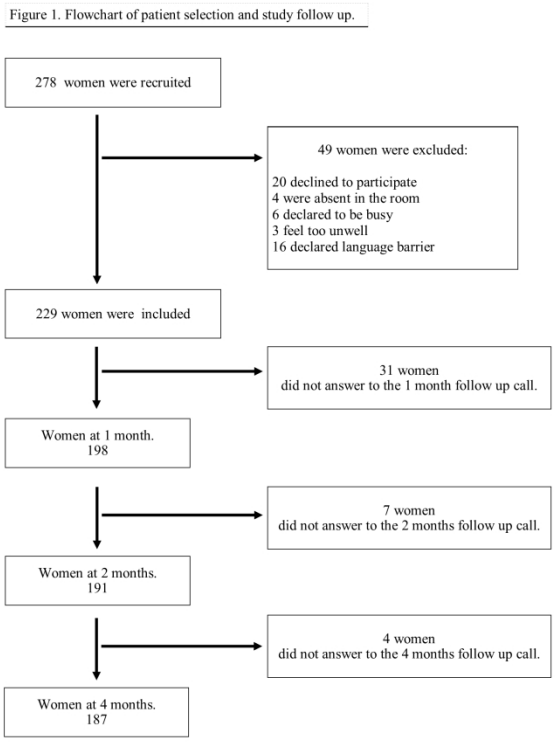

Figure 1. Flowchart of patient selection and study follow up

Figure 2. Distribution of Dropouts During the Follow-up Period of EBF between HL Levels According to the NVS tool (*n*=42).

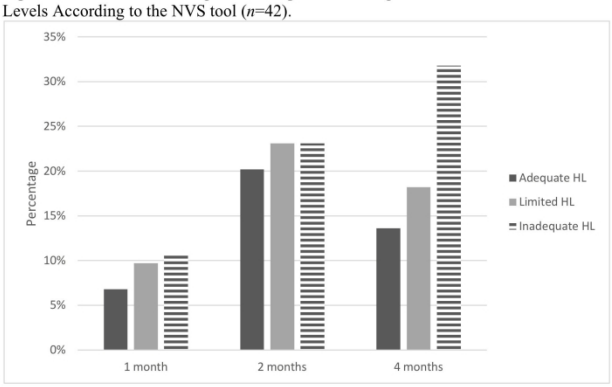

Figure 2. Distribution of Dropouts During the Follow-up Period of EBF between HL Levels According to the NVS tools (n=42).

Figure 3. Distribution of Type of Breastfeeding Between Discharge to the Fourth Month (*n*=229).

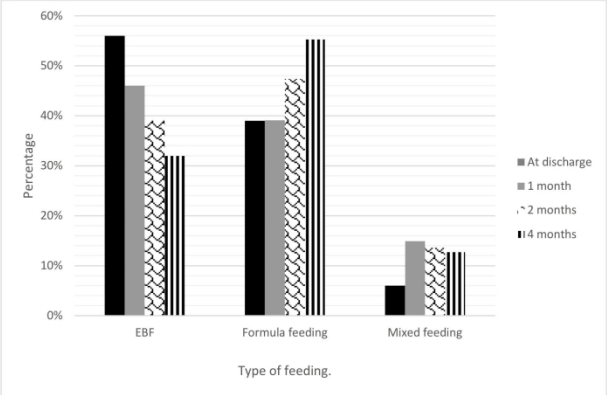

Figure 3. Distribution of Type of Breastfeeding Between Discharge to the Fourth Month (n=229).