

# PROGRAM EVALUATION

## Evaluation of a Breastfeeding History Questionnaire and Screening for the Risk of In-Hospital Formula Supplementation

DRAFT

### **Abstract**

**BACKGROUND:** Early formula supplementation disrupts the natural course of breastmilk production making it difficult for mothers who supplement to return to an exclusively breastfeeding state. In-hospital formula use leads to increased risk of early breastfeeding cessation when compared to infants who are exclusively breastfed in-hospital.

**PURPOSE:** This project evaluated the use and impact of a breastfeeding history questionnaire and screening tool (BAP Breastfeeding History Questionnaire and Screening tool) during hospital stay.

**METHODS:** A retrospective review of 490 couplet charts was completed to evaluate use of the BAP Questionnaire and Screening tool and the effect of lactation support provided to couplets based on their calculated risk.

**RESULTS:** For this project, 282 couplets met inclusion criteria. Of those, 230 couplets were identified as high risk for in-hospital formula supplementation. Six percent of high-risk couplets did not receive lactation support. Of the couplets identified as high risk and who did not receive lactation support, 36% used formula in-hospital.

**CONCLUSION:** Utilizing the BAP Breastfeeding History Questionnaire and Screening Tool prenatally can assist with identifying couplets at risk for in-hospital formula supplementation. Recognizing this risk allows lactation resources to be focused on high-risk couplets to decrease non-medically indicated formula use and promote long term breastfeeding success.

**KEYWORDS:** early formula use, early formula supplementation, exclusive breastfeeding, BAP questionnaire

## Introduction and Background

The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for six months followed by breastfeeding with the addition of solids for one year or longer as desired by the mother and infant couplet (AAP, 2012). Pediatric providers, nurses, and lactation consultants are critical in their communities for advocating in support of breastfeeding as there are very few medical contraindications to breastfeeding (AAP, 2012). Hospitals should provide support for initiation and sustainment of breastfeeding throughout the dyad's hospital stay (Meek & Hatcher, 2017). The benefits of supporting dyads through EBF outweighs the risk of contributing to early breastfeeding cessation by providing early formula supplementation (Temple et al., 2017). Infants exposed to in-hospital formula supplementation are at 2.5 to 6 times higher risk of early weaning (McCoy & Heggie, 2020).

The BAP Breastfeeding History Questionnaire and Screening tool can help identify mothers with increased risk of in-hospital formula supplementation (Bender et al., 2019; Burns et al., 2018). Breastfeeding success is impacted by prior experiences with breastfeeding (Burns et al., 2018). This academic medical center (AMC) performs the BAP Questionnaire on all mothers prenatally or upon inpatient admission directed to elicit a breastfeeding history, identifying how many babies the mother has previously breastfed (B), how many infants she felt she was able to breastfeed successfully (A), and how many infants the mother had problems breastfeeding (P) (Burns et al., 2018). The BAP score is calculated by adding B and A, then subtracting P  $((B+A)-P)$ . The lower the score or a score of zero, indicates a higher risk of in-hospital formula use while a score greater than or equal to two indicates lower risk of in-hospital formula supplementation. Table 1 below illustrates the BAP Breastfeeding History Questionnaire and Screening tool. The purpose of this project was to perform a formal program evaluation of a breastfeeding history

questionnaire and screening program for the risk of in-hospital formula supplementation at an AMC.

Table 1. BAP Breastfeeding History Questionnaire and Screening Tool

B	Number of babies mother has previously breastfed
A	Number of infants mother felt she was able to breastfeed successfully
P	Number of infants mother had problems breastfeeding
BAP Score	(B+A)-P

### Methods

A program evaluation was conducted using the Centers for Disease Control and Prevention (CDC) framework for program evaluation which consists of six sequential steps (1999). Respective auditing of maternal-infant couplet charts via the electronic health record (EHR) was completed. This project was reviewed by IRB and determined to not meet the criteria of Research with Human Subjects.

### Setting

This project took place in the labor and delivery and postpartum units at a 608-bed AMC with a Level 1 Trauma Center. There are 34 Registered Nurses on staff and five nurses per shift, including the charge nurse to fulfill duties in 31 private rooms. There are eight Internationally Board-Certified Lactation Consultants (IBCLCs) on staff. This hospital documented 1,929 live births in 2019. Charts were examined retroactively between September and November 2019 to ensure that holidays and staff furlough/alterations due to the present-day effects of Covid-19 did not skew the results.

### Sample

Between the months of September and November 2019, 490 pregnant mothers were admitted to labor and delivery. Participant inclusion criteria consisted of: women aged 18 years or older with singleton pregnancies who presented to prenatal care prior to 20 weeks gestation with a resulting term delivery ( $\geq 37$  weeks gestation). Exclusion criteria consisted of: multiple gestation pregnancies, pre-term delivery ( $< 37$  weeks gestation), NICU admission, medical contraindication to breastfeeding, or pregnancy loss. Multiple gestation pregnancies, pre-term delivery, and NICU admission dyads were excluded due to the assumed increase of medically indicated formula supplementation. Those with medical contraindications to breastfeeding were excluded out of the necessity to utilize formula as sole infant nutrition. After reviewing each chart for inclusion and exclusion criteria, 334 mother-infant couplets remained. Of those, 52 couplets were excluded for their intent to formula feed. A total of 282 couplets with intent to breastfeed remained to be assessed for this project. Figure 1 portrays a visual for this process. Table 2 depicts the demographic characteristics and Table 3 depicts the birth characteristics.

### **Evaluation Focus**

The author, through consultation with stakeholders, determined desired measures to collect and questions to be answered. The following are the four main foci this project aimed to answer:

***Focus A:*** Analyze and evaluate existing data.

1. Which setting is the BAP Breastfeeding History Questionnaire and Screening tool being completed in routinely?
2. Is a score being given for the questionnaire or can a score be produced retroactively based on answers? If not scored in the EHR, the DNP student will

assign a calculated score to each patient based on written answers determined by the BAP formula. A number will be added for each reported breastfeeding success, followed by a subtraction (if any) of each reported breastfeeding problem. These will formulate the final score.

**Focus B:** Evaluate the response to BAP answers/scores.

1. What are floor staff doing once risk of formula supplementation is recognized?
2. Who initially recognizes the risk and what do they do with that knowledge?

**Focus C:** Evaluate the impact of breastfeeding support (IBCLC or Breastfeeding Specialist).

**Focus D:** Evaluate the effect of the BAP Breastfeeding History Questionnaire and Screening tool on high priority outcomes such as exclusive breastfeeding rates while in-hospital. How do these rates compare at the local and national levels?

### **Data Collection**

Data was gathered for evaluation through retrospective auditing of charts in the EHR system and through personal interviews with staff. Descriptive and quantitative data were both extracted. The quality of the data pulled from these sources was monitored and all data remained deidentified throughout the project. The following data was collected: demographic data, BAP scores, feeding intent, birth characteristics, in-hospital feeding practices, lactation support provided, and feeding practices as the 2-week and 2-month well baby visits. Deidentified data was entered into a Microsoft Excel spreadsheet.

### **Data Analysis**

Descriptive statistics and text analysis were utilized to analyze data. Data was analyzed using Statistical Package for Social Sciences (SPSS), Version 26. A statistician was consulted throughout the data collection and analyzation process.

## **Results**

***Focus A. Analyze and Evaluate the Data:*** The BAP Breastfeeding History Questionnaire questions are currently being assessed prenatally and upon newborn admission to the hospital. In this project, 97% women had the BAP questionnaire documented prenatally and 100% of women had the BAP questionnaire documented upon admission to the unit for delivery. While there was near perfect completion of the BAP questionnaire prenatally, it is not being completed entirely. A final score or risk level is not being calculated or documented in the chart based on the patients' answers. However, this score was able to be retrospectively calculated by the author based on the answers completed in the EHR for this project. The questionnaire does collect appropriate data to predict the risk of in-hospital formula supplementation.

***Focus B. Evaluate the Response to BAP Scores:*** Throughout personal interviews with staff members, we discovered more about the implementation of the questionnaire and the recognition of the risk factor score. Throughout these interviews, it was brought to the attention of the author that the RNs working on the floor may not even be aware of this screening tool or understand the importance of the questionnaire results. Because there is not a calculated score in the chart, a couplet with an increased risk of in-hospital formula supplementation can easily be missed by an RN taking care of the couplet. On the other hand, lactation consultants are able to correctly identify this risk and understand the importance of continued breastfeeding support for mothers with BAP scores revealing increased risk.

***Focus C. Evaluate the impact of breastfeeding support:*** In this study, 230 of 282 total couplets were identified as high risk for formula supplementation. Of those high-risk couplets, 216 received lactation support from lactation consultant, leaving 14 high risk couplets, or 6%, without any lactation support throughout their hospital stay. Five patients who were considered to have a high risk of in-hospital formula supplementation and did not receive lactation support, used formula. Fifty-two couplets were scored as low risk based on their BAP score and 9 of those couplets, or 17%, went without a lactation consult.

Looking at all of the participants, the lactation department consulted 92% of the 282 couplets regardless of risk level. Overall, 24 of the 282 couplets went without a lactation consult and 29% of those couplets supplemented with formula. This is higher than the formula rate for those who received support from a lactation consultant. Of mothers who saw a lactation consultant during their hospital stay, 24% supplemented with formula to some extent while in-hospital. While there is a clinical significance in these numbers, there was no statistical significance found when a Chi-Square test was performed comparing formula supplementation rates of those who received lactation consultant support and those who did not receive lactation consultant support. The Chi-Square test showed the minimum expected count was less than 10 for Lactation Support with Formula, so the Yates' continuity correction was used. The results indicate no significant relationship,  $\chi^2 (1) = .126, p=.722$ .

Overall, 76% of couplets were able to exclusively breastfeed throughout the duration of their hospital stay and 24% of all mothers supplemented with formula in-hospital regardless of their risk or a lactation consult. Formula is currently offered at no charge to the patient while in-hospital. This provides easy access to formula when requested or offered.



*Focus D. Evaluate the effect of the BAP exclusive breastfeeding rates:* When assessing the couplets who met inclusion criteria for this project, it was discovered that of the 334 meeting inclusion criteria, 52 women were automatically excluded for their intent to use formula. The remaining 84% of mothers desired to breastfeed and were included in the study. Of the 282 mothers included in the study due to their intent to breastfeed, all of the mothers initiated breastfeeding for the infants first feeding and met criteria for “ever breastfed”. According to the Breastfeeding Report Card, 82.3% of all U.S. births ever breastfed and 81.7% of Virginia births ever breastfed (CDC, 2018). These rates are comparable to our 84% found in this project. The 2018 CDC Breastfeeding Report Card reports that 17.2% of all U.S. breastfed infants received formula in the first two days of life and 20.9% of Virginia breastfed infants received formula in the first two days of life. In this study, 24% of couplets meeting our inclusion criteria used formula supplementation in the first 2 days of life in-hospital.

*Additional Data:* We looked further into the data to assess breastfeeding status at the 2-week and 2-month postpartum visits. Available data decreased with each well visit. As stated previously, out of 282 couplets, 76% of couplets exclusively breastfed and 24% of couplets utilized some form of formula supplementation during their hospital stay. At the 2-week well child check, data was available for 182 couplets. Of those 182 couplets, 64% exclusively breastfed, 23% utilized a combination of breastmilk and formula, and 13% of couplets exclusively formula fed. At the 2-month well child check, data was available for 166 couplets. Of those 166 couplets, 47% exclusively breastfed, 20% utilized a combination of breastmilk and formula, and 33% of couplets exclusively formula fed. As time continued on, percentages for exclusive breastfeeding rates decreased while formula use increased.

## **Discussion and Recommendations**

The BAP Breastfeeding History Questionnaire should be completed at the first prenatal appointment and a calculated score should be given at that time. By providing the patient's BAP score early on in pregnancy, the prenatal provider can tailor education resources about breastfeeding as needed. One recommendation is having a template or flow sheet inserted into the EHR for ease of usability. The EHR could calculate the BAP score automatically to help direct the attention of the provider assessing the patient to the in-hospital formula use risk level. It is also recommended that bedside nurses interacting with couples understand this tool and the importance of recognizing the BAP score for a couplet's breastfeeding success.

Another major recommendation is increased access to lactation consultants on each shift. While this AMC has a robust lactation department and many floor nurses trained on providing breastfeeding support, not every nurse is trained or comfortable in doing so. Nurses also have multiple patients and a list of tasks for each couplet to accomplish throughout their shift. Floor nurses have also mentioned how beneficial it would be to have a lactation consultant at each delivery to facilitate the first latch while the RN is taking care of various postpartum assessments or postpartum emergencies in that critical first hour after birth. By assigning at least a single lactation consultant to nightshift or to every shift with skeleton crews (holidays, weekends, etc.), we can ensure that a couplet struggling to breastfeed is not provided with formula due to lack of available breastfeeding support. Lactation consultants should continue to prioritize couplets identified as high risk for in-hospital formula supplementation or those couplets with known difficulties when making their rounds.

In order to meet the Healthy People 2020 goals for reducing the use of formula in the first 48 hours of life from 24% to 14% (US Department of Health and Human Services, 2016), we also recommend removal of access to free formula. Currently, at this AMC, there are no extra

charges to the patient for formula use in-hospital. The recommendation is to charge the patient for non-medically indicated formula use in-hospital based on the success in increasing exclusive breastfeeding during the hospital stay in Hong Kong (Tarrant et al., 2015). After the Hong Kong hospital implemented the change of not providing free formula in the hospital, exclusive breastfeeding in-hospital increased from 17.7% to 41.3%. The median duration of breastfeeding also increased from 8 to 12.5 weeks (Tarrant et al., 2015). While exclusive breastfeeding rates in-hospital were much higher in this project's participants compared to that of Hong Kong, charging for formula could still provide an increase of exclusive breastfeeding rates in-hospital. Because early formula supplementation can lead to early cessation of breastfeeding, it is hoped that long-term breastfeeding rates would also increase if this recommendation were to be put in place. If formula use is medically indicated, and thus unavoidable, alternatives to bottle feeding techniques are recommended such as use of a spoon, cup, syringe, or finger feeding.

### **Conclusion**

Performing the BAP Questionnaire prenatally can lead to increased awareness of couplets at high risk for formula use and increase breastfeeding support resources and exclusive breastfeeding rates.

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Table 2. *Demographic Characteristics of Study Participants (N = 282)*

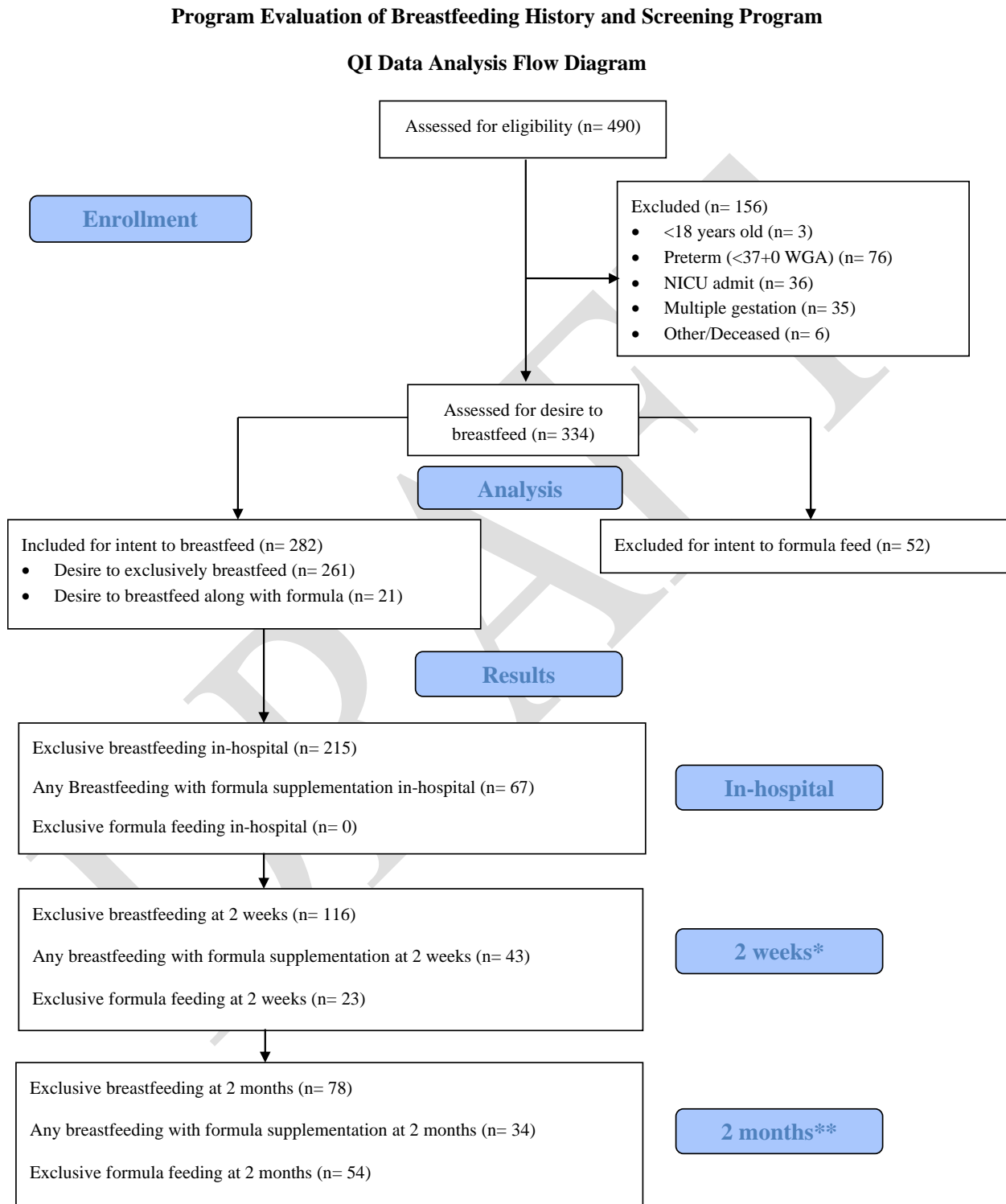
Characteristic	n (%)
Age	
18-19	8 (3%)
20-29	131 (47%)
30-39	136 (48%)
40 or Older	7 (2%)
Race	
White	184 (65%)
Black or African American	41 (14%)
Asian	10 (4%)
Other (including multiracial)	47 (17%)
Hispanic, Latino or Spanish Origin	
Yes	52 (18 %)
No	230 (82%)
Marital Status	
Single	105 (37%)
Married	168 (60%)
Separated	6 (2%)
Divorced	1 (<1%)
Engaged	1 (<1%)
N/A	1 (<1%)
Insurance	
Medicaid	109 (39%)
Aetna	73 (26%)
Anthem	44 (16%)
United Healthcare	26 (9%)
Tricare	15 (5%)
Cigna	6 (2%)
Piedmont Community Health	3 (1%)
Optima	2 (1%)
None listed	2 (1%)
VHN Medcost Virginia	1 (<1%)
Parity	
Primiparous	107 (38%)
Multiparous	175 (62%)

Table 3. Delivery Characteristics of Study Participants (*N* = 282)

Characteristic	n (%)
<b>Delivery Characteristics</b>	
Spontaneous Vaginal Birth	199 (70%)
Assisted Vaginal Birth	5 (2%)
Vaginal Birth After Cesarean (VBAC)	13 (5%)
Cesarean Birth	65 (23%)
<b>Anesthesia</b>	
None	51
Spinal/Epidural	204
Nitrous Oxide	25
General Anesthesia	3
Local Anesthesia	4
<b>Time of Delivery</b>	
Day Shift (0700-1900)	130 (46%)
Night Shift (1900-0700)	152 (54%)

<sup>a</sup>Some patients used multiple anesthesia modalities

Figure 1. Consort flow diagram depicting couplets included for analysis



\*Data available on 182 couplets only

\*\*Data available on 166 couplets only