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# A quasi -experimental study on the effects of a breastfeeding reminder system on breastfeeding in two tertiary medical centers

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## Abstract

**Introduction** In the face of unchanging high rates of stunting among 12-23 months old Filipino babies, sustaining exclusive breastfeeding up to 6 months old remains a challenge. This study determined the effect of a breastfeeding reminder system on breastfeeding.

**Methods** This is a quasi-experimental study. Mothers were regularly given breastfeeding reminders by SMS and phone call. The weight, body length, episodes of upper respiratory tract infection and diarrhea were compared between the babies who were given exclusive breastfeeding and those whose exclusive breastfeeding was not sustained. Pearson Chi – square test and t-test at p=0.05 determined significance of differences of variables.

**Results** From March- October 2020, there were 450 babies included in the study. Of these babies, 44.8% were given exclusive breastfeeding up to 6 months. Timely initiation of breastfeeding was practiced by 91.95% of the mothers in the study. Babies who did not receive exclusive breastfeeding were shorter than those who received exclusive breastfeeding at 1 year old (70.11cm +2.78 vs.75.47cm +1.41, p<0.001) and at 2 years old (80.89 cm +2.30 vs. 87.29cm +1.47, p<0.001). At 2 years old, babies who received exclusive breastfeeding had no episodes of diarrhea and minimal (2%, p<0.001) episodes of acute respiratory infections.

**Conclusion** Due to the implementation of the reminder system, the percentage of babies exclusively breastfed up to 6 months of age increased to 44%. This is a significant improvement compared to a previous study where only 29% of the babies were exclusively breastfed. At one and two years old, babies who were not exclusively breastfed had stunting, weighed less and had more infections (diarrhea and URTI).

**Key words:** exclusive breastfeeding, infants, stunting

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According to the World Health Organization's 2018 Report on Infant and Young Child Feeding, optimal breastfeeding is of utmost importance, as it has the potential to save the lives of over 820,000 children under the age of 5 years annually.<sup>1,2</sup> This significance is evident in the context of declining under-five mortality rates over the past 15 years; however, neonatal mortality has not seen the same level of reduction. Neonatal deaths still account for 45% of all under-5 deaths, highlighting the importance of focusing on breastfeeding practices to address this issue.<sup>3,4</sup>

The benefits of exclusive breastfeeding up to 6 months of age are vast and encompass various aspects. In the WHO publication reviewing current scientific knowledge on exclusive breastfeeding, it highlights that this practice fosters essential interaction and bonding between mother and baby, particularly during a critical period in early brain development. During this time, the combination of optimal nourishment, positive stimulation, and attentive care can significantly enhance the formation of neural pathways in the developing brain.<sup>5</sup> Moreover, there is compelling evidence indicating that anything other than exclusive breastfeeding increases the risk of overweight and obesity. This underscores the importance of promoting exclusive breastfeeding as a crucial factor in supporting the long-term health and well-being of infants.<sup>6</sup>

Despite extensive evidence highlighting the vital importance of breastfeeding for infant and early child health, there have been only modest improvements in breastfeeding rates in the country over the last decade. A significant concern lies beyond the neonatal period, as the numbers remain discouraging, with 3 out of 5 infants under 6 months of age not receiving the protective benefits of exclusive breastfeeding. This situation underscores the urgent need for targeted interventions and increased awareness to promote exclusive breastfeeding and improve the overall health outcomes of infants in the country.<sup>1</sup>

Aligned with the strategic thrust of promoting breastfeeding during the first 6 months of life and appropriate introduction of complementary feeding at 6 months old, another key strategic focus is the intensified mobilization of local government units (LGUs). This approach aims to strengthen support and engagement from local authorities in implementing and advocating for breastfeeding initiatives, creating an enabling environment for mothers and families to practice exclusive breastfeeding and optimal complementary feeding practices. By collaborating with LGUs, enhance awareness, accessibility, and sustainability of breastfeeding programs can be enhanced further and improve the overall health and well-being of infants and young children in the community.<sup>7</sup>

As the local government units (LGUs) undergo capacity building and mentoring on nutritional program management to become self-propelling, it is essential to address the need for additional support

from a tertiary government hospital to augment the programs directed towards the LGUs. In fact, another crucial strategic thrust is the complementation of actions between the national and local governments. By fostering collaboration between a tertiary government hospital and the LGUs, the overall impact of nutritional programs can be strengthened. The hospital can provide specialized expertise, resources, and technical assistance to further enhance the LGUs' efforts in promoting and implementing breastfeeding and nutritional initiatives effectively. This synergistic approach will empower both levels of government to work together towards a common goal of improving maternal and child health outcomes and creating a healthier future for the community.<sup>7</sup>

The PPAN 2017-2022 places significant importance on addressing malnutrition in 38 priority areas, with the northern NCR or CAMANAVA region being identified as one such priority area.<sup>7</sup>

The study consists of two primary sites. The first site is a tertiary government hospital located within the CAMANAVA area, which covers the cities of Caloocan, Malabon, Navotas, and Valenzuela. Notably, this area has been identified as a priority area in the PPAN 2017-2022, emphasizing its significance in addressing malnutrition. The second site is a private tertiary medical center situated in the northern NCR, geographically adjacent to the CAMANAVA region.

Therefore, this study aimed to enhance the existing breastfeeding programs of local government units by providing additional support to promote timely breastfeeding initiation right after delivery. To bolster exclusive breastfeeding practices up to 6 months of age, a reminder system was implemented using various communication channels such as SMS, viber messaging, and voice calls. Beyond 6 months, the reminders emphasized complementary feeding while continuing breastfeeding. It is worth noting that this approach is not a novel concept, as the World Health Organization (WHO) recognizes the effectiveness of telephone counseling and other technological interventions as valuable adjuncts. Such strategies empower not only end-users but also health workers and lay or peer counselors, contributing to more successful and sustained breastfeeding practices within the community. By leveraging these proven methods, the study aimed to further improve breastfeeding rates and ultimately enhance the nutritional status and

health outcomes of infants and young children in the study area.<sup>8</sup>

This study determined the effects of a breastfeeding support program by telephone counselling encounters in two tertiary medical centers on breastfeeding rate with the following specific objectives:

1. identified the demographics of the mothers in the study population.
2. determined the rate of timely breastfeeding initiation among the study population.
3. determined the effect on breastfeeding rate of telephone counselling encounters on mothers who were able to sustain exclusive breastfeeding for 6 months and those who were not able to sustain exclusive breastfeeding (EBF).
4. compared the weight and height and weight for height at 1 year and 2 years old of infants who had EBF and did not have EBF up to 6 months
5. compared the rate of acute upper respiratory tract infections and acute diarrhea in infants at 1 year and 2 years old between the two groups (those who had EBF and did not have EBF up to 6 months)

## Methods

This is a quasi-experimental study that focused on term babies born between March and September 2020 in two hospitals, with a follow-up period until the children reached 2 years of age. The hospitals involved in the study included a tertiary government medical center and a private tertiary hospital located in close proximity to each other. Ethical approval for the study was obtained from the ethics committees of both hospitals to ensure the protection and well-being of the participants.

All mothers who had uncomplicated deliveries at the two medical centers were included in the study. After obtaining written informed consent, relevant maternal data were collected, including age, parity, BMI, educational attainment, and employment status. For neonates, birth weight and Z scores were recorded.

During the first 6 months of infancy, mothers received reminders or wellness checks via telemedicine twice a month. These reminders focused on encouraging exclusive breastfeeding continuation, timely immunization, and monitoring for any episodes of respiratory tract infections or diarrhea. After the

6-month mark, monthly wellness checks through telemedicine continued, aimed at supporting mothers in sustaining both breastfeeding and appropriate complementary feeding based on the child's age. Additionally, these check-ins encompassed monitoring immunization schedules and recording weight and body length or height during immunization visits to local health centers. The wellness checks also involved inquiring about any episodes of respiratory tract infections or diarrhea.

The use of telemedicine for wellness checks was considered standard of care for follow-up of infants born during the data collection period. This approach was adopted due to limitations brought upon by the pandemic, such as lack of public transportation and surges in COVID-19 admissions at the institutions. Only asymptomatic or well infants were included for the wellness checks, ensuring a focus on maintaining the health and safety of the participants. Mothers were instructed to contact the researchers for any health-related concerns related to their babies.

By incorporating telemedicine for wellness checks, the study aimed to provide essential support to mothers and monitor infant health closely during a challenging period, ultimately contributing to better maternal and child healthcare outcomes within the context of the pandemic.

Chi-square and t-tests were employed to assess significant differences between babies who received exclusive breastfeeding and those who did not, with a significance level ( $\alpha$ ) set at 0.05 for categorical and continuous variables, respectively. The data analysis was performed using SPSS version 23

## Results

The study included a total of 450 babies. Among them, 202 babies (44.8%) received exclusive breastfeeding (EBF) for 6 months, while 248 babies (55.1%) did not. As depicted in Table 1, the mothers in both groups showed comparability in terms of age, BMI, parity, educational attainment, and employment status. Additionally, the babies' birthweights were comparable, even when categorized based on appropriateness for gestational age. Furthermore, timely initiation of breastfeeding was found to be comparable ( $p=0.141$ ) in both groups, with an average of 91.95%.

Table 2 presents the Z scores of the two groups, which were obtained using the growth charts provided

**Table 1.** Demographics of mothers who were able to sustain exclusive breastfeeding (EBF) and who were not able to sustain exclusive breastfeeding (EBF).

Demographics	EBF Sustained, Numbers (%)	EBF Not Sustained, Number (%)	p value
Age of mother (Mean,+ SD)	26.12 + 5.99	26.10 + 5.80	0.976*
BMI (Mean,+ SD)	23.28+3.68	23.36 + 3.80	0.825*
Parity (%)			
1	94 (48.5)	104 (43.9)	0.439*
2	65 (33.5)	79 (33.3)	
≥ 3	35 (18)	54 (22.8)	
Mother's educational attainment			
Elementary	8 (4.1)	9 (3.8)	0.202*
High School	94 (48.5)	124 (52.3)	
College	92 (47.4)	104 (43.9)	
Mothers who are regularly working			
Fulltime	135 (69.9)	164 (69.2)	<0.001**
Parttime	50 (25.9)	33 (13.9)	
Unemployed	8 (4.1)	40 (16.9)	
Birth weight (Mean,+ SD)	2.91 +0.38	2.92+ 0.39	0.741*
AGA 0 Z score	167 (86.1)	205 (86.5)	0.991*
SGA (low Z score)	15 (7.7)	18 (7.6)	0.991*
LGA	12 (6.2)	14 (5.9)	
Timely initiation of breastfeeding	189 (93.6)	224 (90.3)	0.141*

\*t test

\*\* Pearson Chi square

by the World Health Organization (WHO) for males and females. These Z scores served as a reference for assessing the infants' growth and development. Z scores falling within the range of -1 to +1 were classified as normal, indicating healthy growth. Z scores equal to or below -2 were categorized as low, indicating potential growth restriction, while Z scores equal to or above +2 were classified as high, suggesting possible accelerated growth.

Based on the analysis of mean body length or height for age at 1 year, babies who did not receive exclusive breastfeeding exhibited lower Z scores compared to babies who received exclusive breastfeeding (70.114 + 2.78 vs. 75.47 + 1.41,  $p < 0.001$ ). This trend persisted at 2 years of age, with babies who did not receive exclusive breastfeeding having lower Z scores (80.89 + 2.30) compared to those who received exclusive breastfeeding (87.29 + 1.47,  $p < 0.001$ ).

Furthermore, a higher percentage of babies who did not receive exclusive breastfeeding had low Z

scores compared to those who received exclusive breastfeeding. At 1 year old, 89.4% of babies who did not receive EBF had low Z scores, whereas only 2.6% of babies who received exclusive breastfeeding had low Z scores ( $p < 0.001$ ). At 2 years old, 98.7% of babies who did not receive EBF had low Z scores, while none of the babies who received exclusive breastfeeding had low Z scores ( $p < 0.001$ ).

These findings indicate a significant association between exclusive breastfeeding and better growth outcomes in terms of body length or height for age at both 1 year and 2 years of age. Babies who received exclusive breastfeeding showed higher Z scores and a lower prevalence of low Z scores, emphasizing the importance of exclusive breastfeeding in promoting optimal growth and development during the first two years of life.

Based on the analysis of mean body weight at 1 year old, babies who did not receive exclusive breastfeeding exhibited lower Z scores compared to

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**Table 2.** Z-scores of babies given exclusive breastfeeding (EBF) and who were not given exclusive breastfeeding (EBF) using weight for age at 1 and 2 years old, height for age at 1 and 2 years old, and weight for height (WHZ) at 1 and 2 years old.

Demographics	EBF Sustained, numbers (%) 202	EBF Not Sustained, number (%) 248	p value
Body Length at 1 year	75.47+1.41	70.114+2.78	<0.001
Z score normal	189 (97.4)	25 (10.5)	<0.001
Z score low	0 (0.5)	211 (89)	
Z score high	4 (2.1)	1 (0.4)	
Body length at 2 years	87.29+1.47	80.89+2.30	<0.001
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	
Weight at 1 year old (kg+sd)	9.35+0.56	7.14+0.54	<0.001
Z score normal	194 (100)	0	<0.001
Z score low	0	237 (100)	
Z score high	0	0	
Weight at 2 years old (kg+sd)	14.08+12.02	8.85+0.52	<0.001
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	
WHZ Z score at 1 year old			
Z score normal	194 (100)	169 (71.3)	<0.001
Z score low	0	68 (28.7)	
Z score high	0	0	
WHZ Z score at 2 years old			
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	

babies who received exclusive breastfeeding (7.14 cm + 0.54 vs. 9.35 cm + 0.56,  $p < 0.001$ ). This difference remained significant at 2 years old, with babies who did not receive exclusive breastfeeding having lower Z scores (8.85 cm + 0.52) compared to those who received exclusive breastfeeding (14.08 cm + 12.02,  $p < 0.001$ ).

At 1 year old, all babies with low Z scores were those who did not receive exclusive breastfeeding, while none of the babies who received exclusive breastfeeding had low Z scores (100% vs. 0%,  $p < 0.001$ ). At 2 years old, the majority of babies with low Z scores were those who did not receive exclusive breastfeeding, with only a negligible percentage having low Z scores among those who received exclusive breastfeeding (98.7% vs. 0%,  $p < 0.001$ ).

A significant difference in weight-for-height Z score (WHZ) at 1 year old was observed between the two groups, with babies who received exclusive

breastfeeding having a higher percentage of normal WHZ scores compared to those who did not (100% vs. 71.3%,  $p < 0.001$ ). Similarly, at 2 years old, only 1.3% of babies who did not receive exclusive breastfeeding had a normal WHZ score, while all babies who received exclusive breastfeeding had a normal WHZ score ( $p < 0.001$ ).

Table 3 reveals the notable increase in the rate of acute upper respiratory tract infections among babies who did not receive exclusive breastfeeding compared to those who had exclusive breastfeeding. At 6 months old, 8% of babies who did not receive exclusive breastfeeding experienced acute upper respiratory tract infections ( $p < 0.001$ ). Similarly, at 12 months old, 7.6% of babies who did not receive exclusive breastfeeding had acute upper respiratory tract infections ( $p < 0.001$ ).

While the rate of infections appeared comparable at 18 months old ( $p = 0.070$ ), there was a significant

increase ( $p = 0.047$ ) in the incidence of infections among babies who were not given exclusive breastfeeding.

Table 4 presents a striking finding, demonstrating the complete absence of acute diarrhea in all age groups included in this study among babies who received exclusive breastfeeding ( $p = 0.001$ ). In comparison, babies who did not receive exclusive breastfeeding exhibited a higher incidence of acute diarrhea.

### Discussion

The goal of ending preventable child deaths and reducing neonatal mortality to at least 12 per 1,000 live births highlights the urgent importance of ensuring that all newborns are breastfed within the first hour of life.<sup>2</sup> Successful exclusive breastfeeding necessitates early initiation of breastfeeding, meaning breastfeeding should commence within 1 hour of birth. Early initiation of breastfeeding is crucial as it serves as a protective measure for the newborn, reducing the risk of infections and decreasing newborn mortality rates. By promoting and prioritizing early initiation of breastfeeding, there can be significant strides towards achieving these vital healthcare objectives and securing better health outcomes for newborns.<sup>9,10</sup>

Thus, “The Every Newborn Action Plan” was introduced as a comprehensive initiative that recognizes

the critical role of early initiation of breastfeeding in reducing preventable neonatal mortality.<sup>11</sup> This action plan aims to tackle a significant issue, as in 2015, out of 140 million live births, only 45% of newborns were breastfed within the first hour of life. By emphasizing and prioritizing early initiation of breastfeeding in its road map and joint action platform, this initiative seeks to address this alarming statistic and promote the well-being of newborns worldwide. By encouraging early breastfeeding initiation, newborns can be provided with essential nutrients, immunity, and protection against infections, ultimately contributing to a substantial reduction in neonatal mortality rates and ensuring a healthier start to life for every baby.<sup>11,12</sup>

The barriers to the simple yet cost-effective approach of early initiation of breastfeeding are diverse, with cultural norms and traditions being one of the foremost challenges. This aspect holds particular significance as multi-cultural communities are being served. Addressing and overcoming these barriers are crucial to improving neonatal health and well-being. McKenna, et al. observed that traditional beliefs in certain communities consider colostrum as dangerous, leading to its wastage instead of recognizing its vital nutritional benefits for newborns. In other settings, cultural practices involve feeding newborns tea, butter, sugar water, honey, or animal

**Table 3.** Rate of acute upper respiratory tract infections among babies who had exclusive breastfeeding (EBF) and whose exclusive breastfeeding (EBF) were not sustained by single age (in weeks).

Age	EBF Sustained, numbers (%) With AURI	EBF Not Sustained, number (%) With AURI	p value*
6 mos	0 (0)	19 (8)	<0.001
12 mos	0	18 (7.6)	<0.001
18 mos	2 (1)	9 (3.8)	0.070
24 mos	4 (2.1)	14 (5.9)	0.047

\*Pearson Chi-square

**Table 4.** Rate of acute diarrhea or loose bowel movement among babies who had exclusive breastfeeding (EBF) and whose exclusive breastfeeding (EBF) were not sustained by single age (in weeks).

Age	EBF Sustained, numbers (%) With LBM	EBF Not Sustained, number (%) With LBM	p value*
6 mos	0 (0)	12 (5.1)	0.001
12 mos	0 (0)	17 (7.2)	<0.001
18 mos	0 (0)	8 (3.4)	0.010
24 mos	0 (0)	11 (4.6)	0.002

milk before they are breastfed, which can interfere with the early initiation of breastfeeding and deprive infants of the essential nutrients and immune protection found in colostrum.<sup>13</sup> To promote early initiation of breastfeeding successfully, it is essential to work collaboratively with communities, understanding and respecting their cultural beliefs and practices. Engaging in culturally sensitive approaches and raising awareness about the benefits of early breastfeeding initiation, help dispel misconceptions and traditional barriers, ultimately fostering healthier practices for newborns and contributing to the reduction of preventable neonatal mortality.

In the 2018 Expanded National Nutrition Survey (ENNS) conducted by the Department of Science and Technology Food and Nutrition Research Institute, it was found that the rate of early or timely initiation of breastfeeding in 2018 was 69.2%. This percentage was significantly higher ( $p < 0.05$ ) than the rate of 65.1% recorded in 2015, but lower than the rate of 77.1% obtained in 2013.<sup>14,15</sup> In the current study, the average rate of timely initiation of breastfeeding was notably higher at 91.95%. Additionally, the rate of babies who were eventually given exclusive breastfeeding for 6 months was higher than those who did not, although the difference was not statistically significant (93.6% vs. 90.3%,  $p = 0.141$ ). These findings suggest that there has been progress in improving the rate of timely initiation of breastfeeding in recent years, but there is still room for further improvement to match or exceed the rates achieved in 2013. Additionally, although there was a higher proportion of babies receiving exclusive breastfeeding for 6 months in this study, the difference compared to those who did not receive exclusive breastfeeding was not statistically significant. This highlights the need for continued efforts to promote and support exclusive breastfeeding practices for improved infant health and development.

After timely initiation of breastfeeding, sustaining exclusive breastfeeding becomes crucial due to compelling reasons. Studies, such as the one conducted by Sankar, have shown that in low- and middle-income countries, infants who receive mixed feeding (introduction of foods and liquids other than breastmilk before 6 months) face up to 2.8 times higher mortality risk than those who are exclusively breastfed. The risk of mortality is even higher among infants who are not breastfed at all, as they face a staggering

14-fold higher risk of death when compared to their exclusively breastfed counterparts.<sup>16</sup>

Sadly, the 2016 UNICEF Global Database on breastfeeding reported that in 2015, only 31% of infants received exclusive breastfeeding from 0-6 months old.<sup>2</sup> This highlights the need to increase efforts to promote and support exclusive breastfeeding in early infancy.

In this study, at 6 months old, 44.8% of babies received exclusive breastfeeding alongside complementary feeding in addition to breastmilk. This marked increase in breastfeeding rate is noteworthy when compared to the 2018 report from the Food and Nutrition Research Institute (FNRI) on the Nutritional Status of Filipino Infants and Young Children 0-23 months, which indicated a breastfeeding rate of 29% at 5.9 months.<sup>15</sup> Despite the improvements, it appears that gains in breastfeeding rates are modest and not sustained substantially, as evidenced by similar data from previous nationwide surveys.

These findings emphasize the need for continuous and comprehensive efforts to encourage exclusive breastfeeding practices, addressing cultural barriers, and enhancing support systems to achieve better health outcomes for infants and young children. Promoting and sustaining exclusive breastfeeding up to 6 months of age and beyond can play a critical role in reducing infant mortality and improving overall child health.

The Department of Health National Nutrition Council's Philippine Plan of Action for Nutrition (PPAN) 2017-2022 Executive Summary identifies the low rate of exclusive breastfeeding as a key nutrition problem that needs to be addressed. Sub-optimal breastfeeding practices contribute to these low rates, depriving infants of the essential nutrients required for optimal growth during their most rapid growth phase.<sup>7</sup> To combat this issue, the PPAN 2017-2022 sets intermediate outcome targets, one of which is to increase the prevalence of exclusive breastfeeding among infants aged 5 months old. The goal is to raise the prevalence from 24.7% in 2015 to 33.3% by the year 2022. The Executive Summary of the Philippine Plan of Action for Nutrition 2017-2022 highlights another concerning issue - high levels of stunting and wasting among children under-five years of age. These levels have remained largely unchanged over the years. In 2014, the prevalence of stunting in children under 5 years old was 33.4%.<sup>7</sup> Unfortunately, this situation has barely improved, as evidenced by the 2018 Expanded

National Nutrition Survey (ENNS) conducted by the Department of Science and Technology Food and Nutrition Research Institute, which reported a stunting rate of 36.6% among infants aged 12-23 months.<sup>15</sup>

These statistics emphasize the need for continued efforts and interventions to address the persistent problem of stunting in young children. Stunting can have long-term adverse effects on physical and cognitive development, and addressing this issue is crucial to ensuring the healthy growth and development of the nation's future generations. By prioritizing and implementing targeted measures to combat stunting, the Philippine Plan of Action for Nutrition aims to make significant progress in improving child nutrition and reducing the prevalence of stunting among young children in the country.

The findings of this study align with the broader issue of stunting in young children due to non-exclusive breastfeeding. Babies who did not receive exclusive breastfeeding exhibited stunting at both 1 year and 2 years old, with a significantly higher percentage affected compared to those who were exclusively breastfed at the same age groups (89% and 98.7% vs. 0.5% and 0%,  $p < 0.001$ , respectively).

Moreover, the mean height Z scores for both age groups among the non-exclusively breastfed babies were observed to be -2, indicating a negative impact on their growth and development.

In addition to stunting, wasting was also present in the non-exclusively breastfed group, as indicated by Z scores of -2 for weight and weight for height (WHZ) scoring.

These results underscore the critical role of exclusive breastfeeding in promoting healthy growth and development in young children. Non-exclusive breastfeeding is associated with an increased risk of stunting and wasting, which can have long-term consequences on a child's overall health and well-being. The study highlights the importance of supporting and encouraging exclusive breastfeeding practices to ensure optimal nutrition and health outcomes for infants during their early years of life.

Therefore, it is highly advisable to adapt the World Health Organization's (WHO) guidelines on counseling women to improve breastfeeding practices. These guidelines advocate for the provision of at least six breastfeeding counseling contacts, which allow for comprehensive support to breastfeeding mothers and their families. The counseling should commence

during the antenatal period and continue throughout the various stages of breastfeeding and introduction of complementary feeding.<sup>8</sup>

The minimum of six breastfeeding counseling contacts may occur at the following time points:

1. Before birth (antenatal period)
2. During and immediately after birth (perinatal period up to the first 2–3 days after birth)
3. At 1–2 weeks after birth (neonatal period)
4. In the first 3–4 months (early infancy)
5. At 6 months (at the start of complementary feeding)

These counseling contacts play a crucial role in educating and supporting mothers, enabling them to overcome challenges and establish successful breastfeeding practices. By providing continuous guidance and assistance at various stages, breastfeeding mothers can receive the necessary encouragement and information to ensure optimal breastfeeding outcomes. Implementing these WHO guidelines can contribute significantly to enhancing breastfeeding rates and promoting better health for both infants and mothers.

The higher rate of respiratory tract infections and diarrhea observed among non-exclusively breastfed babies ( $p < 0.001$ ) is a significant contributing factor to the issue of malnutrition in the early years of life.<sup>17</sup> Poor infant and young child feeding practices during the first two years, combined with recurrent bouts of infection, can help explain the elevated levels of stunting.<sup>7</sup>

Respiratory tract infections and diarrhea are common illnesses in young children, and non-exclusive breastfeeding can compromise their immune system, making them more susceptible to these infections. Additionally, inadequate nutrition due to suboptimal feeding practices further weakens their immune response and overall health. The combination of frequent infections and inadequate nutrition can lead to malnutrition, which, in turn, contributes to stunted growth in children.

Addressing the problem of non-exclusive breastfeeding and promoting proper infant and young child feeding practices is crucial to break this cycle and reduce the burden of stunting. Providing comprehensive support for exclusive breastfeeding and appropriate complementary feeding, along with

measures to prevent and manage infections, can significantly improve the nutritional status and overall health of infants and young children, ultimately reducing the prevalence of stunting and its associated long-term consequences.

Stunting is a prevalent issue, affecting 89% of babies at 1 year old and a significant 98% at 2 years old among those who did not receive exclusive breastfeeding. In contrast, at 2 years old, none of the babies who received exclusive breastfeeding had diarrhea, and only a minimal 2% experienced acute respiratory infections. These findings highlight the crucial role of exclusive breastfeeding in promoting better health outcomes for infants, reducing the risk of infections, and potentially preventing stunting.

To address this concern effectively, it is recommended to prioritize maternal education on breastfeeding practices during the antenatal period. Equipping expectant mothers with knowledge and skills about breastfeeding can positively influence their attitudes and practices, laying a strong foundation for successful breastfeeding experiences.

Additionally, providing continuous follow-up and support through breastfeeding counseling up to 6 months can prove instrumental in helping mothers navigate the challenges they may encounter during the breastfeeding journey. This personalized guidance and encouragement can play a vital role in sustaining exclusive breastfeeding and fostering a nurturing and nourishing environment for both mother and child.

By incorporating maternal education and ongoing counseling, healthcare providers can empower mothers to make informed choices about breastfeeding and ensure the well-being of infants, leading to improved nutrition, reduced infections, and a potential decrease in stunting prevalence. These interventions collectively contribute to the overall health and development of infants and set them on a path towards a healthier future.

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