

Nurturing New Beginnings: A Quality Improvement Journey to Enhance Early Breastfeeding Initiation rates

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ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p> <hr/> <p>Article History: Received: Accepted:</p> <hr/> <p>Keywords: Breast milk, Colostrum, Quality improvement, early breastfeeding initiation, PDSA cycle.</p>	<p>Introduction: The World Health Organisation (WHO) has universally recognized breastfeeding as the best way to give newborns the nutrients they need for healthy growth and development, especially during the first six months of life. Even with this acknowledgment, the world's rates of the early start of breastfeeding (EIBF) are still below optimal levels, which has a substantial impact on the mortality rates of newborns. The objective of our study was to address the challenge of low EIBF rates among neonates delivered vaginally through a rigorous quality improvement process.</p> <p>Materials and Methods: A quality improvement study was conducted over six months at Pt B.D. Sharma PGIMS, Rohtak. The study involved postnatal mothers vaginally delivering neonates above 34 weeks gestation. A multidisciplinary team employed the Plan-Do-Study-Act (PDSA) methodology to address barriers to EIBF systematically. Baseline EIBF rates were measured, obstacles were identified through process mapping and analysis, and change ideas were iteratively tested.</p> <p>Results: Initial assessments revealed a baseline EIBF rate of 0%. Through successive PDSA cycles, policy gaps, procedural inefficiencies, staffing constraints, and facility limitations were systematically identified and addressed. Interventions included immediate breastfeeding initiation in the delivery room and targeted staff education. Over the study period, EIBF rates significantly improved, reaching an average of 85%.</p> <p>Conclusion: This study shows that EIBF rates among newborns delivered vaginally can be greatly increased with the use of a systematic quality improvement approach. Barriers to EIBF were successfully reduced through iterative PDSA cycles and the involvement of important stakeholders, resulting in long-lasting practice changes. The results highlight the benefits of early breastfeeding initiation for the health of both mothers and babies, as well as the possible influence of focused interventions on medical procedures.</p>
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Introduction

The cornerstone of infant nutrition is breastfeeding, recommended by the World Health Organisation (WHO) as the most natural and effective way to provide babies with the critical nutrients they need for healthy growth and development, especially during the first six months of life (1).

Nevertheless, neonatal mortality, which accounts for about half of all fatalities among children under five, continues to be a serious global concern (2).

Many approaches have been used globally to address this pressing issue, with early initiation of breastfeeding (EIBF) emerging as a crucial intervention. Early initiation of breastfeeding (EIBF) in postnatal patients holds paramount importance in ensuring the health and well-being of both the mother and the newborn. This practice, recommended by various health organizations, including the World Health Organization (WHO) and UNICEF, involves initiating breastfeeding within the first hour after birth. Here is a detailed introduction explaining the significance of this practice.

1. Establishment of Bonding: The process of mother-infant bonding is promoted by EIBF. Oxytocin is released when a newborn and mother make instant skin-to-skin contact and nurse, which fosters feelings of warmth and compassion. The basis for a stable attachment, which is essential for the child's socioemotional development, is laid by this emotional bond. According to a study by Moore et al. (2016), mother attachment behaviors were greatly improved by early skin-to-skin contact (3).

2. Colostrum Consumption: The mother's first milk, colostrum, contains vital nutrients and antibodies. It offers essential immunological components that guard against illnesses and infections. EIBF ensures the baby gets this nutrient-rich material in the first few hours of life. Early breastfeeding beginning was linked to a higher likelihood of exclusive breastfeeding at six months, according to a meta-analysis by Patel et al. (2016). The early exposure to colostrum may partially explain this association (4).

3. Stabilization of Neonatal Physiology: The newborn's physiological processes can be stabilized by breastfeeding right after

birth. Breastfeeding regulates an infant's blood sugar, heart rate, and temperature. Furthermore, newborns experience less stress and are more calm when they are physically near their mothers, which fosters a sense of security. Early skin-to-skin contact and nursing were shown to increase neonates' cardiorespiratory stability, according to a randomized controlled trial by Stevens et al. (2014)(5).

4. Maternal Health Benefits: The mother can benefit from early breastfeeding initiation in several ways. It increases the force of uterine contractions, facilitating the placenta's exit and lessening bleeding after giving birth. Furthermore, nursing causes the uterus to contract, releasing oxytocin into the bloodstream and hastening the healing process after childbirth. Early skin-to-skin contact and breastfeeding were linked to decreased postpartum hemorrhage and improved uterine tone, according to a study by Moore et al. (2016) (3).

5. Promotion of Exclusive Breastfeeding: Increased exclusive breastfeeding rates have been associated with EIBF. Early breastfeeding starts a pattern that moms and babies will likely stick to within the coming days, weeks, and months.

In order to promote the best possible health and development for infants, the World Health Organization recommends exclusive breastfeeding for the first six months of life. It helps to reach this goal.

Smith et al. (2015) conducted a comprehensive review and meta-analysis, revealing a strong correlation between exclusive breastfeeding (EIBF) and breastfeeding at six weeks postpartum (6). However, disparities in the prompt commencement of breastfeeding continue despite international recommendations. Only 41.6% of newborns in India were breastfed during the first hour of birth, according to data from the National Family Health Survey (NFHS-4), indicating the need for focused initiatives to close this gap (7). Conventional methods of bringing about change, such as creating policies and running awareness campaigns, have not shown much promise in producing long-lasting gains (8).

Consequently, improving breastfeeding behaviors requires a methodical and

evidence-based approach, particularly for infants delivered vaginally.

This study attempts to address the problem of raising the percentage of babies born by normal vaginal delivery that initiate nursing within the first hour of life in light of this environment.

In order to promote early breastfeeding initiation and enhance infant health outcomes, this project aims to investigate and apply successful techniques customized to local contexts through a quality improvement framework involving Plan-Do-Study-Act (PDSA) cycles.

Materials and Methods

Study setting - PGIMS Rohtak

Study design- Quality improvement study

Study participants-

Inclusion criteria: Postnatal mothers who had delivered after 34 weeks vaginally were included in the study.

Exclusion criteria: (1) Sick babies who required nursery admission and (2) Sick patients, such as eclampsia and comatose patients who were not able to feed their babies, were excluded.

Duration of study – 6 months

Methodology

The Institute Ethics Committee approved the study (IEC). This quality improvement project used a sequence of Plan-Do-study-Act (PDSA) cycles. It took place at the labor room complex from January to June 2020, spanning six months. The study included all stable babies delivered vaginally and with a gestational age of 34 weeks or less.

All stable infants with unconscious moms (e.g., patients with eclampsia) and unstable newborns in need of immediate resuscitation were not included in the study. Additionally, infants with GI malformations or cleft palates, for whom breastfeeding was not recommended, were not included in the study.

The process comprised several consecutive steps:

1. Baseline rate of breastfeeding within the first hour of vaginal delivery was measured.
2. Process flow mapping and Fishbone analysis were done to elicit the possible reasons for the delay in initiating breastfeeding.

3. A team of obstetricians, pediatricians, and nurses was formed to analyze the problem and develop change ideas.

4. A series of Plan-Do-Study-Act (PDSA) Cycles conducted to test change ideas brought forth by the team

5. The effect of change ideas was assessed by run charts to interpret the serial measurements of indicators and to study the impact of change ideas.

6. The normal baby care includes documentation of the early commencement of feeding. The nurses' practice included recording feed initiation to monitor ongoing rates of early breastfeeding initiation.

7. From randomly chosen assets, the qualitative experiences of mothers, nurses, and doctors were gathered to identify the causes of early breastfeeding failure and the advantages of the adjustments.

8. The necessary steps were made to maintain the improvement.

While run charts were used to show and interpret the sequential measurements of indicators graphically, descriptive statistical analyses were used to describe baseline variables. It allowed for the evaluation of the effects of implemented adjustments. The main outcome measure was the percentage of neonates that began nursing within the first hour of life.

Results

This study revealed that, among the eligible newborns delivered vaginally, none of them received breast milk within an hour of birth, indicating that there was no early commencement of breastfeeding among these newborns. Table 1 shows that among patients who were born vaginally, the median time to start breastfeeding was 101 minutes.

Several vaginal births were watched in order to map and comprehend each step leading up to the start of nursing. Figure 1 shows the creation of a process flow map that lists every stage in the process and a fishbone diagram that highlights potential core causes of feed initiation delays. We discovered that the infant had been placed under observation following delivery, but the episiotomy had not yet been stitched, and other procedures had not been finished. The infant was weighed, dressed, given a

vitamin K injection, and had their footprints taken for the staff registration in the LR nursery. The mother arrived at the postnatal ward after completing all of these

formalities, and the baby was brought to her for breastfeeding after more than an hour had passed, which caused a delay in the breastfeeding schedule of less than an hour.

Table 1: Baseline average time for breastfeeding initiation in babies born by vaginal route.

Days	Number of vaginal deliveries observed	Average time of breastfeeding initiation (minutes)
Day 1	10	90
Day 2	8	100
Day 3	6	110
Day 4	9	90
Day 5	11	120
Day 6	5	110
Day 7	7	90
The average time for breastfeeding		101 minutes

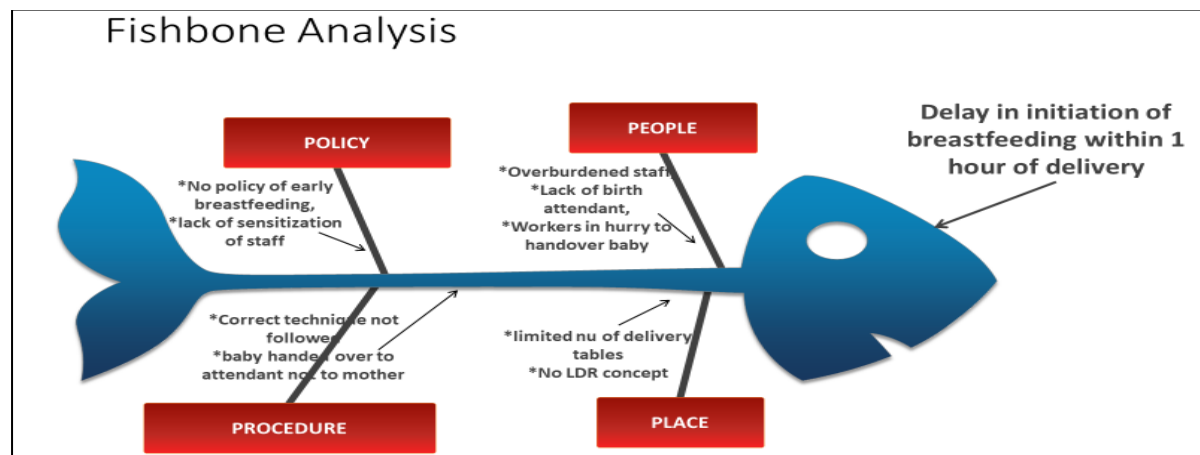


Fig 1: Fishbone analysis of possible reasons of delayed initiation for breastfeeding in babies born by vaginal delivery

It became clear at the team meeting when the present process flow map was reviewed that the only way to start nursing within the first hour is to do it inside the LR complex before the mother and child are moved out. It was decided to start breastfeeding as soon as possible after the baby was born, with the assistance of a staff nurse at the delivery table. Other staff nurses took care of other postpartum procedures, such as administering vitamin K ink and taking the baby's footprint. It is an example of a proactive strategy to remove obstacles to the early commencement of breastfeeding. The need to establish early breastfeeding

through the first PDSA cycle was stressed to the labor room staff members. As a result of this change notion spreading throughout the entire team, 71% of newborns were nursed within an hour postpartum after the first PDSA cycle, which was initiated after the suggested modification was implemented.

Even with the early success, logistical issues surfaced, and the intervention plan had to be adjusted. We learned that the pediatrician had to wait until the end of the process to complete it since he is the only pediatrician for LR, and an additional workforce is needed. Therefore, in the

following PDSA cycle, we modified our plan to give the baby to the pediatrician after delivery. Once the pediatrician and staff nurse have completed their tasks, the baby will be placed back on the mother's breast with assistance from the staff nurse or birth companion, and breastfeeding will be started. When we reanalyzed after two weeks, we discovered that 78.8% of newborns were nursed within an hour after delivery. Everyone agreed that this change concept was both realistic and acceptable. Consequently, the plan was for all eligible

newborns to be breastfed in the labor room following standard medical protocols. While the mother was holding the infant, the staff nurse would assist her.

A flowchart detailing the proposed new procedure was created and sent to the medical professionals and nurses. After that, in further PDSA cycles, the change notion was methodically extended to include more deliveries. In each PDSA cycle, different obstacles to compliance were identified and addressed in later cycles (Table 2).

Table 2: Details of each of the PDSA cycles implemented throughout the study.

PDSA CYCLE	PLAN	DO	STUDY	ACT
PDSA-1	Make out the feasibility of breastfeeding on the delivery table just after delivery.	The baby put to the mother's breast with the help of a staff nurse, cord clamp etc., done simultaneously.	71% of babies were breastfed. One more staff nurse was needed; the nurse had to wait till the end.	Try feeding with the help of an attendant (birth companion) in the next PDSA.
PDSA-2	Asses the feasibility of feeding with the help of an attendant on the delivery table.	The baby was put into the mother's breast and feeding started with the help of an attendant and then handed over to the pediatrician.	78.8% of babies were breastfed. The load of nurses decreased, and the mother felt mental support due to the presence of the attendant but, the pediatrician had to wait till the end of the whole process.	Try feeding after a pediatrician examines the baby in the next PDSA.
PDSA-3	Asses the feasibility of breastfeeding after a pediatrician did his job.	After cord clamping, the baby was given to the pediatrician, and once he was examined, the baby was again handed over to the mother with the help of an attendant.	75% of babies were breastfed. Pediatricians need not wait till the end. There is some confusion in staff regarding the process.	This idea can be applied to many cases in the next PDSA. Classes of healthcare workers are to be taken to clear the doubts.
PDSA-4	Asses rate of initiation of breastfeeding in consecutive days.	Electronic reminders via whatsapp and orientation class of every changing team in LR taken.	The rate of initiation decreased by about 60%. The reasons for noncompliance were a lack of awareness and the team forgetting to feed during several deliveries	In the next PDSA cycle, try to initiate feeding after pt is shifted to the postnatal ward if it cannot be done on the delivery table as it can cover 1st hour of delivery itself.
PDSA-5	Asses the initiation of feeding rates.	Roles and responsibilities and the whole process are clarified among doctors and nurses.	86% of compliance. Mothers felt satisfied.	It could be applied to a large number of cases. SOP for breastfeeding in LR could be made.

In PDSA 5, the average time it was taken for breastfeeding initiation after delivery was

found to be 24 minutes (Table 3).

Table 3: Average time of breastfeeding in the PDSA cycles

PDSA CYCLES	Total number of patients delivered vaginally	Babies breastfed within 1 hour (number)	Percentage
PDSA 1	50	35	71%
PDSA 2	48	37	78.8%
PDSA 3	39	29	75%
PDSA 4	42	25	60%
PDSA 5	52	44	86%

During the trial, the rate of early breastfeeding initiation increased from 0% (baseline) to 86% (PDSA-4) (Table 4). Following PDSA-5 completion, we found

that over 86% of breastfeeding compliance was maintained over the first hour, as shown by the run chart (Fig 2).

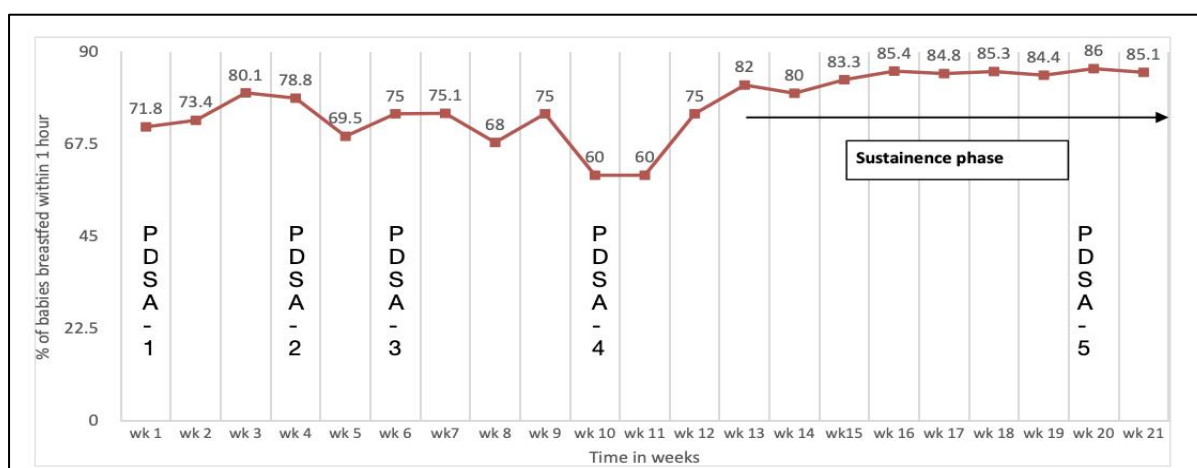


Fig 2: Run Chart showing an increase in breastfeeding initiation rates within 1 hour in babies born vaginally gradually from a baseline of 0 to 85% by the 5th PDSA cycle

Table 4: Percentage of babies breastfed within 1 hour in the subsequent PDSA cycles.

PDSA CYCLES	Number of breastfed babies within 1 hour	Average time of breastfeeding (minutes)
PDSA 1	35	10
PDSA 2	37	15
PDSA 3	29	25
PDSA 4	25	20
PDSA 5	44	24

We received feedback from women who were delighted to hold and feed their kids immediately after birth. A mother expressed, "I was overcome with joy and forgot all the pain when I held my baby."

The LR nurses did not feel that their burden was increased, and they were glad to assist moms in holding their babies.

Overall, this initiative demonstrated the importance of systematic quality improvement approaches in healthcare settings to address barriers and improve outcomes such as EIBF rates, which are critical for infant health and well-being.

Discussion

Using successive cycles of PDSA and the model for improvement but without any new resources, we demonstrated a large and persistent enhancement of first-hour initiation of breastfeeding rates in newborns delivered via vaginal birth in a busy government hospital, such as PGIMS Rohtak. The calculation of the percentage of neonates among the research participants who could begin nursing early was the primary finding of the investigation. Staff members first showed resistance and inertia to this shift, as is common with any practice change.

However, the LR nursing staff progressively adopted the change idea using various methods, including phone calls and WhatsApp notifications, posters, group talks, and personal discussions on the advantages of EIBF and ongoing staff motivation. A methodical strategy for gathering data to improve procedures and results in particular healthcare settings quickly is known as quality improvement. These are periodic, with the outcomes of one initiative used to guide the next activity (9). One of the most widely used tools in quality improvement is the Plan-Do-Study-Act (PDSA) technique.

These quality improvement concepts—first used in industries—have been extended to the healthcare sector to lower error and variance in results. The PDSA cycle consists of four steps. Creating a plan, which identifies activities and states likely outcomes, is the first phase, or "Plan." Step two, "Do," is when the plan is implemented.

The "Study" process involves analyzing the data and obtaining the desired results. Based on the data assessment in the study step, the strategy is adopted, modified, or abandoned in the last step, "Act." The following cycles are guided by inferences from the preceding cycle (9).

We utilized run charts to analyze the impact and effect of change suggestions. Run charts give us an objective way to see whether incremental enhancements to the system or process over time result in gains with little to no mathematical complexity. Because run charts are useful and easy to use, they have a lot of potential applications in the healthcare field for both practitioners and decision-makers (10).

There are several advantages to breastfeeding for both the mother and the child (11). Successful breastfeeding depends on key factors, such as frequent on-demand feedings, limiting maternal-infant separation, starting within the first hour after birth, and establishing skin-to-skin (STS) contact soon after birth (12).

The WHO further recommends that mothers of healthy full-term babies, irrespective of the method of delivery, remain in the same room for the entire 24-hour period, except for intervals of up to an hour for hospital procedures, beginning from the moment mothers return to their room following delivery or as soon as they can nurse their infant (13).

Research indicates that mothers who stay in the same room as their newborns produce high levels of milk, nurse for longer lengths of time, and are more likely to exclusively breastfeed their children than women who spend less time with their infants, such as those who have babies in the nursery (14).

Skin-to-skin (STS) contact between mother and newborn shortly after birth, starting during the first hour of birth, limited maternal-infant separation, and frequent on-demand feeds are all important for effective breastfeeding (15).

In addition to the benefits of breastmilk, putting the infant on the breast provides the additional benefits of early skin-to-skin contact (16). According to the most recent NFHS, India has a relatively low rate of early breastfeeding initiation (41.6%) (17).

Childbirth can be difficult for a woman who is unable to see her kid join the world (18). Allowing mom to touch and feed the baby soon after birth might help her feel empowered and in charge. Parenting abilities improve as the mother holds and feeds the infant herself, which improves the baby's neurodevelopment (19). The current study confirms the findings of others that suggest that putting the babies on the mother's breast for skin-to-skin contact/feeding immediately after birth is viable (20). Traditional approaches to implementing new changes without consulting frontline workers have had minimal success (21). Thus, there are always significant gaps between evidence and practice. In this quality improvement program, we began by involving representatives from all stakeholders and frontline staff, and we then used scientific methodologies to diagnose the fundamental causes of the problem in the local context. We asked frontline employees to generate potential solutions from within themselves and test them objectively on a small scale as a team to learn about the implementation challenges. It allowed us to refine and adapt our strategy to make it more acceptable and practicable. We were able to integrate the modification into current processes without adding workload. We feel this contributed to our long-term success.

Conclusion

Using consecutive customized PDSA cycles resulted in a significant enhancement in the first hour of nursing. The interventions implemented were pamphlets, health education, group discussions, and one-on-one interactions with staff members. We achieved our research goal. The study reveals that implementing QI principles can boost breastfeeding rates within 1 hour after birth. This tactical integration with current procedures helped to achieve long-term improvements.

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