

## Effect of Reflex Zone Stimulation on Maintenance and Initiation of Lactation among Lactation Failure Mothers

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### Abstract:

**Background:** Breastfeeding is a natural human activity. To have the full benefit of breastfeeding, the WHO recommends exclusive breastfeeding for at least six months of life and supplemented breastfeeding for at least one year. **Aim:** To evaluate the effect of reflex zone stimulation on maintenance and initiation of lactation among lactation-failure mothers. **Design:** A pre and post-test quasi-experimental research design was utilized. **Subjects:** 100 Postnatal Lactation failure mothers of convenience sampling technique were used to select the sample. **Setting:** The study was conducted in the postpartum Unit at Mansoura University Hospital. **Two tools were used:** Tool (I): The postnatal lactation failure mothers assessment sheet and Tool (II): The modified Breastfeeding Assessment Scale was used to assess the level of lactation before and after the intervention. **Results:** The present study revealed that in pre-assessment all 60 (60%) mothers had lactation insufficiency and in post-assessment 34(57%) of the mothers had an average level of lactation and 26(43%) of the mothers had an adequate level of lactation. The pre-test mean score was 5.3, whereas in post -the test mean score was 19.92 statistically highly significant at the level of  $p < 0.05$ . **Conclusion:** reflex zone stimulation intervention has a positive effect on maintenance and initiation of lactation among lactation-failure mothers. **Recommendations:** Providing training regarding reflex zone stimulation to help maintain and initiate lactation among lactation failure mothers which should be recommended in either clinical or community settings.

**Keywords:** Initiation of lactation, Lactation Failure Mother, Reflex Zone Stimulation.

### Introduction:

A woman's function is expanded and changed into that of a mother during the unique bio-psychosocial process known as motherhood. The natural process of childbirth is exquisitely crafted, and the care that a mother and child receive after the infant is born is as vital to their continued health. A period of extreme physical and emotional stress brought on by weariness, anxiety, and excitement is known as the puerperium. Due to involution and lactation, every mother must adapt to the physical changes in her own body (Deepak& AkoijamMamata, 2021).

Breastfeeding and infection prevention are the two most important factors for newborns in tropical nations. The Latin term lactan, which means to suckle, is where the word lactation originates. The term lactation derives from the verb lactate, which means to create and provide breast milk, or, more specifically, to breastfeed a child. The process through which a woman produces milk and colostrums in her breast is known as lactation. Many exocrine glands, in particular the pituitary hormones

prolactin and ox toxin, regulate lactation. It is influenced by maternal emotions and the sucking process. The health and happiness of the mother affect the amount of milk produced (Noronha, 2023).

. The creamy yellow material called colostrum contains a lot of nutrients for the developing baby as well as maternal antibodies that shield the infant from illness. Thus, breastfeeding is crucial for the health of a newborn baby and is highly recommended. Two The "bonding" process between a mother and her newborn is facilitated by breastfeeding right after delivery. It is the first point of contact and the first time that nursing is initiated. Early skin-to-skin contact and the chance to suck during the first hour or shortly after delivery are crucial for the start of breastfeeding. There is a close relationship between sucking and contact (Bushnell et al., 2019).

Both the mother and the child benefit from early initiation, which keeps the infant warm and helps the child develop eating skills more quickly and successfully. As soon as the baby is colonized by her safe microbes, it begins to get colostrum. These are both crucial for the baby's life and protection from infections. Furthermore, it promotes healthy uterine contractions, expedites placental

ejection, lowers maternal blood loss, and guards against anemia. In the initial hours after delivery, it helps the mother's blood sugar level and other biochemical markers to remain at a better level. (Christensson et al., 2022).

Reflex zone stimulation is a technique used to apply pressure to the hands, feet, and fingers using particular thumb, finger, and hand movements without the use of oil, cream, or lotions. It is based on a system of zones and reflex areas that reflect the image of the body on the hands and feet, with the idea that such work affects a physical change in the body (Christensson et al., 2020).

Pressure sensors found in the hands and feet are a component of the reflexive response of the body that enables the "fight or flight" response to a threat. Prepare your hands and feet for battle and escape by communicating with your body's internal organs. The adrenal glands can help you prepare for either scenario. An example of this coordinated activity is the quick rush of adrenaline that allows someone to move an automobile. The reflex network that enables every action we take is activated by the feet and hands' sense of pressure. Applying reflexology regularly helps to exercise these pressure sensors, conditioning the interior organs to which they are intrinsically linked (Amanda, 2020).

Zone reflex simulation has been rediscovered numerous times throughout history and around the world. Zone reflex simulation medicine was practiced in Egypt, China, and Japan, according to archeological data. With the investigation of the nervous system and reflex in Europe and Russia during the 19th century—think Pavlov—the idea of Zone reflex simulation started to take shape in the West. Originally developed as medical procedures, reflex treatments were quickly superseded by the use of medicines and surgery. Dr. William Fitzgerald, a Connecticut-based expert in otology, introduced the concept of reflex usage for better health to America in 1909 and continued iteratively after that. It is believed that by 1938, physiotherapist Eunice Ingham had created a system of reflex zones. The 1980s saw the rediscovery of ancient Chinese practices in the East throughout Asia creating today's Zone reflex simulation a rich environment with reflexology path in parks and a thriving reflexology industry of practitioners, businesses, and research (Mirzaie et al., 2019).

After the baby is born, life becomes quite busy. New routines must be established, sleep deprivation, irregular feeding schedules, and general tiredness are common. If new parents could just carve out a little time for themselves, it would be a great moment for them to benefit from Zone Reflex Simulation. Zone reflex simulation can assist in promoting calmness and relaxation, lowering stress levels, boosting energy,

realigning the body, supporting lactation, helping stabilize body weight, and lessening the likelihood of postpartum depression (Zhang, 2020).

Maternity Zone reflex simulation helps women with prenatal and postpartum issues, such as breastfeeding, as well as conception, fertility, pregnancy, and labor. Zone reflex simulation helps in conception by clearing the body of toxins, balancing hormones, and promoting maximum health for all body processes. In addition to relieving pregnancy-related discomforts, Zone reflex simulation speeds up labor accelerates recuperation, and lowers the risk of postpartum depression (Gattil, 2019).

Zone reflex simulation is a useful tool for helping mothers relax so that their bodies, minds, and spirits may be more supported, which in turn helps initiate and sustain nursing. In addition, regarding postpartum massage and therapeutic Zone reflex simulation, Laura Thomas mentions research where participants who got ten therapeutic Zone reflex simulation treatments saw an 86 percent rise in milk supply. In addition to the well-known benefits of Zone reflex simulation for boosting milk supply, it also helps new mothers relax and facilitates nursing (Amanda, 2020).

Worldwide, there is a lot of opportunity for encouraging early breastfeeding initiation. If breastfeeding is started within an hour after birth, 22% of newborn deaths can be avoided. Breastfeeding should begin during the first hour of birth, according to recommendations from UNICEF, WHO, WABA, and all other government bodies. Breast milk serves as a baby's natural first food, providing all the energy and nutrients required for the first few months of life. It also continues to meet a child's nutritional needs for up to half of the first year and up to one-third of the second year of life. Breast milk shields the baby from infections and long-term illnesses while fostering sensory and cognitive development (DeChateau & Wiberg, (2020).

Exclusive breastfeeding speeds up the healing process during illness and lowers baby mortality from common childhood illnesses like pneumonia or diarrhea. It is natural for humans to breastfeed. The WHO advised exclusive nursing for at least six months of life and supplemented breastfeeding for at least a year to reap the full benefits of breastfeeding. Also, 75.0% of new mothers breastfed their babies at six months, 43.0% did so at twelve months, and 22.2% did so at twelve months. Anesthesia, heavy sedation, prolonged labor, surgical intervention, placenta retention, and other factors may contribute to the over 50% of mothers who fail to nurse their babies appropriately, putting them at risk of lactation failure (Edmond et al., 2021).

There were relatively low percentages of breastfed infants by day one (median 72%, interquartile range 60-82%) and within the first hour (median 36%, interquartile range 26-52%). If 99 percent of babies started nursing on their first day of life, or during the first hour of life, it was anticipated that neonatal mortality might be decreased by 24 percent for all countries combined. Alternatively, it could be lowered by 31 percent (Fifer & Moon, (2019).

According to a global risk assessment, the developing country's children's years of life lost as a result of inadequate breastfeeding have resulted in deaths and attributable fractions of deaths from lower respiratory tract infections and diarrheal disease of 55% and 53%, respectively, for the first six months of infancy, 20% and 18% for the second six months, and 20% for all-cause deaths in the second year of life. The scientists concluded that inadequate breastfeeding in poor nations results in the loss of up to 1.45 million lives worldwide or 117 million years of life. According to the study, starting breastfeeding within an hour could reduce neonatal mortality by 22% overall. It asks for assistance for all mothers during the first hour to ensure early initiation of breastfeeding (ILCA, 2023).

Global incidence indicates that the most crucial intervention for a child's survival is adequate nursing, and the sooner a baby is breastfed—during the first hour of life, ideally—the better. Merely 25% of moms in the nation begin nursing within the first hour of giving birth; in Rajasthan, this figure is 14%, while in Bihar and Uttar Pradesh, it is 4% and 7%, respectively. For the first six months of life, infants should only be fed breast milk; no other meals or fluids, not even water, should be given. This recommendation is made by the Indian government and international organizations (ILCA, 2023).

If breastfeeding was started during the first hour of life, 41.3 percent of neonatal deaths may be avoided. This equates to averting 22.3% of all newborn fatalities. In a similar vein, starting breastfeeding on the first day of life may have prevented 30.2% of newborn deaths by day 2. When one considers a stressful period in their life, having a child comes in a close second. A new life added to one's family brings emotional stress in addition to the physical strain that childbirth places on the body. If breastfeeding was started during the first hour of life, 41.3 percent of neonatal deaths may be avoided. This equates to averting 22.3% of all newborn fatalities. In a similar vein, starting breastfeeding on the first day of life may have prevented 30.2% of newborn deaths by day 2. When one considers a stressful period in their life, having a child comes in a close second. A new life added to one's family brings emotional stress in addition to the physical strain that childbirth places on the body (Illingworth, 2022).

Using pressure points, touch, or massage in certain foot locations to improve health and induce relaxation, reflex zone stimulation may be one of the most powerful natural healing techniques. This can help nursing moms become more lactating. Additionally, it has been shown to help postpartum moms produce more milk by causing the body to relax. Zone reflex stimulation helped new mothers breastfeed more rapidly and with greater satisfaction. Zone reflex stimulation also assisted in avoiding the usage of medications during lactation, which could have negative side effects for the mother and the infant. Additional research indicates that women who receive more milk receive foot Zone reflex stimulation after birth. A study showed that reflex zone stimulation promotes milk flow and balances hormone production (Laura, 2020).

#### **Significance of the study:**

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Early postpartum breastfeeding rates were 75.0%, 43.0%, and 22.2% at six and twelve months of age, respectively. It appears that over 50% of mothers did not adequately nurse their children, putting them at risk of breastfeeding failure. These reasons could include stress, exhaustion, anxiety based on unfounded worries, anesthesia, severe sedation, prolonged labor, surgical intervention, placenta retention, etc. It is natural for humans to breastfeed. The WHO advised exclusive nursing for at least six months of life and supplemented breastfeeding for at least a year to reap the full benefits of breastfeeding (Danaus, 2021).

Applying reflex zone stimulation is a successful lactation start technique that is used in various regions of the nation. This is one technique that any postpartum mother can take to avoid using medicines during nursing that could be harmful to the unborn child. Researchers in India discovered that the majority of people are not aware of the reflex zone stimulation technique when lactation first begins. To gain experience and raise awareness among healthcare professionals about the benefits of the reflex zone stimulation approach for the onset of lactation (Mirzaie et al., 2018). By doing this, the researchers hoped to evaluate the effect of reflex zone stimulation on maintenance and initiation of lactation among lactation-failure mothers.

#### **Aim of the study:**

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To evaluate the effect of reflex zone stimulation on maintenance and initiation of lactation among lactation failure mothers through:

- 1 Assessing the level of lactation among lactation failure mothers.
- 2 Evaluating the effect of reflex zone stimulation on initiation and maintenance of lactation among lactation failure mothers.

**Subjects and Method**

**Design:**

A pre and post-test using experimental research design was utilized to achieve the aim of this study.

**Setting:**

The study was conducted in the postpartum Unit at Mansoura University Hospital.

**Sample:**

100 postnatal lactation failure mothers of convenience sampling technique were used to select the sample

**Tools for data collection:**

Two tools were used:

**Tool (I): Postnatal lactation failure mothers assessment sheet:**

This was created by the researchers after reviewing related literature (Danaus, 2021, Mirzaie et al., 2019). It is divided into two parts:

- **Part one:** Demographic data which gives baseline information about Lactation failure mothers such as age, educational status, occupation, and residence.
- **Part two: Obstetric and postnatal Data:** - It included data related to parity, type of delivery, history of abortion, family history of lactation insufficiency, nature of marriage, and duration of marriage.

**Tool (II): Modified Breastfeeding Assessment Scale:**

adopted from UNICEF UK Baby Friendly Initiative & HSE (2022) which was used to assess the level of lactation before and after the intervention, This scale has 13 questions and the total score was 26.

**Scoring system:**

The scoring system was calculated as: (2) for the "correct" answer and (0) for the "incorrect" answer. The total score ranges from 0 – 26, a higher score indicates an adequate level of lactation. It was categorized for each mother into "adequate, average and inadequate level of lactation " as follows: inadequate <50 %, average from 50% to 75 %, and adequate >75 %.

How you and your midwife can recognise that your baby is feeding well				
What to look for/ask about	✓	✓	✓	✓
<b>Your baby:</b>				
has at least 8 -12 feeds in 24 hours*				
is generally calm and relaxed when feeding and content after most feeds				
will take deep rhythmic sucks and you will hear swallowing*				
will generally feed for between 5 and 40 minutes and will come off the breast spontaneously				
has a normal skin colour and is alert and waking for feeds				
has not lost more than 10% weight				
<b>Your baby's nappies:</b>				
At least 5-6 heavy, wet nappies in 24 hours*				
At least 2 dirty nappies in 24 hours, at least £2 coin size, yellow and runny and usually more*				
<b>Your breasts:</b>				
Breasts and nipples are comfortable				
Nipples are the same shape at the end of the feed as the start				
How using a dummy/nipple shields/infant formula can impact on breastfeeding?				
<b>Date</b>				
<b>Midwife's initials</b>				
<b>Midwife:</b> if any responses not ticked: watch a full breastfeed, develop a care plan including revisiting positioning and attachment and/or refer for additional support. Consider specialist support if needed.				

### Tools validity and reliability

Test-retest reliability was established, Cronbach's alpha coefficient approach was used to compare test scores from multiple administrations, and the instrument's content validity was assessed by three maternity nursing professionals along with their comprehensiveness, significance, appropriateness, and intelligibility. There were no modifications made based on the panel's evaluations of the content's appropriateness and sentence clarity.

### Pilot study

To assess the feasibility of the research method and notice clarity, a pilot study including ten **postnatal lactation failure mothers**, or 10% of the sample, was conducted. There were no changes made. The pilot study **postnatal lactation failure mothers** were included in the pilot project.

### Ethical considerations:

Before starting the research, ethical approval was obtained from the scientific research ethics committees of the faculties of nursing. The researchers met both medical and nursing directors of the selected settings to clarify the purpose of the study and get their approval. Written consent was obtained from the **postnatal lactation failure mothers** to participate in the study after the objective of the study was explained to them. The researchers informed the **postnatal lactation failure mothers** that, the study was voluntary, they were allowed not to participate and they had the right to withdraw from the study at any time, without giving any reason. Moreover, they were assured that their information would be confidential.

### Fieldwork:

The researchers have been to the previously selected areas twice a week, from 9 am to 1 pm. They met one-on-one with postnatal lactation failure moms and introduced themselves before outlining the goal of the research. Data was collected over six months, from July 1st to December 31st, 2023. It took fifty to forty minutes to finish each interview tool.

### The fieldwork was completed by following these steps:

Reflex zone stimulation on maintenance and initiation of lactation among lactation failure mothers

- At first, the researcher had short discussions with the **postnatal lactation failure mothers** and established a good relationship. The tools are filled out by the

researchers. The following steps were taken to achieve the intervention after the researchers showed the **postnatal lactation failure mothers** how to do reflex zone stimulation and followed up with them a week after to maintain and initiate lactation.

- All **postnatal lactation failure mothers** had their levels of lactation assessed twice throughout the study period by the researchers: once on the first day of delivery and again one week later.
- The pre-test was conducted by using the Modified Breast Feeding Assessment Scale by the investigator. Then all the samples were administered the intervention of Reflex Zone Stimulation to all those who have agreed to participate.
- Reflex Zone Stimulation included the application of pressure on the toes of the feet using techniques like thumb walking and pressure circles. It is administered for 10 minutes each day for 7 days among post **postnatal lactation failure mothers**.
- Pre-procedure
- 1. Explain the procedure to the mother
- 2. Provide a comfortable and unconstrained position to the mother
- 3. Ask the mother to avoid talking during the intervention unless necessary.
- The procedure of reflex zone stimulation:
- STEP 1: Wash hands.
- STEP 2: Assess the Modified Breast Feeding Assessment Scale score during breastfeeding before the intervention using the Modified Breast Feeding Assessment Scale breastfeeding assessment scale.
- STEP 3: Apply reflex zone stimulation over the toes of the foot for 10 minutes using the following steps (i) Ask the mother to lie in a supine or semi-sitting position. (ii) Ask to keep the feet with toes pointing upward. (iii) Support the right foot of the mother with the left hand of the researcher and start with a relaxation massage from the toes to the heel. (iv) Stimulate the meridian points at the toes in clockwise and anti-clockwise directions. (v) Thumb walking should be started from the base of the big toe to the top and from the top to the base and the same technique should apply for the other foot toes till the outside of the little finger.
- Go back to the big toe and apply pressure to the planter surface of the big toe and other toes with the finger knuckle of the researcher. (vii) The thumb walking for the right foot is 5 minutes and repeats the same technique for the left foot for another 5 minutes. (viii) The same

procedure has to be repeated after 24-hour intervals for both feet for 3 days.

- It started with the giving pressure at the SI-1 point present on the little finger's dorsal aspects. Stimulation will provide for 1 to 1 and a half minutes on both hands. The second point of stimulation is UB -67 posterior to the nail's corner on the lateral side of the little toe in both legs little finger of lactation failure mother. The Third point of stimulation is ST -17. At the center of the nipple, rotate the nipple clockwise and anticlockwise. The fourth point is CV -17, present at the midway of the nipples. On the midline of the sternum. After giving all stimulation, ask the mother to feed her baby after 4-5 minutes. Stimulation will be provided on the 2nd and 3rd day of delivery until the 7<sup>th</sup> day, two times a day for better results.
- After the 7<sup>th</sup> day, the post-test was conducted by using the same tool in the same manner. The study proved that the effective practice of Reflex Zone Stimulation was found to be effective in improving lactation among lactation failure mothers.

#### **Statistical analysis:**

The statistical program SPSS version 20 was used to examine the data. For three days, continuous data were collected before and following the massage, and the results were reported as mean standard deviation (SD). To express categorical data, percentages, and integers were used. While the paired t-test was used to examine differences between each group before and after a massage session, the independent t-test was utilized to examine differences between the two groups. An analysis of variance (ANOVA) based on one-way repeated measures was used to examine changes in fatigue levels. When a variable defied the parametric assumptions, the Mann-Whitney test was applied. To assess the outcomes, the chi-square test was employed. Using the chi-square test, the relationship between the two variables was examined. To evaluate the association between two variables in the case of noncontiguous data, the chi-square test was employed. A P value of less than 0.05 was used to determine statistical significance.

#### **Results:**

**Table 1** demonstrates that, about age, 53% of the lactation failure mothers were in the 21–25 year age range. The moms' educational status revealed that 62% of them were illiterate. In terms of the mothers' occupations, (74%) belonged to the category of housewife, while (26%) had a job. Of the moms living there, (48%) are from metropolitan areas, and (52%) are from rural ones.

**Table 2:** Shows that of the women, (56%) were multipara mothers in terms of parity. The women (58%) had a typical vaginal delivery as their method of delivery. Mothers who reported having no prior abortion experience made up 85% of the sample. Only 4% of the moms have a positive family history of lactation insufficiency when it comes to their own experience. Ninety percent of the moms belonged to non-consanguineous marriages, whereas five (8.3%) were part of consanguineous marriages. Of them, (40%) were married for some time longer than four years.

According to **Table 3**, 100% of the lactation failure mothers had insufficient lactating before Reflex Zone Stimulation. However, there was a statistically significant difference between the pre and post-reflex Zone Stimulation scores at the level of  $p < 0.001$  for the frequency and percentage-wise distribution of the level of lactation among lactation failure mothers. Of these, 60 (60%) of the mothers had an average level of lactation, and 40 (40%) had an adequate level. Figure One demonstrated the same thing.

According to **Table 4**, the mean value before Reflex Zone Stimulation was 5.6, with a standard deviation of 1.77. However, the mean value after Reflex Zone Stimulation is 19.88, with a standard deviation of 2.78. Thus, it has been discovered that reflex zone stimulation works well for both starting and continuing lactating.

**Table 5** shows the paired t-test results for lactation failure mothers' pre- and post-reflex Zone Stimulation levels. 14.77 is the overall mean difference between before and post-reflex Zone Stimulation. With a p-value of less than 0.001, the paired "t" test total result of 46.33 is statistically large.

Table1. The postnatal lactation failure mothers distribution regarding their demographic data Table 1 (n=100)

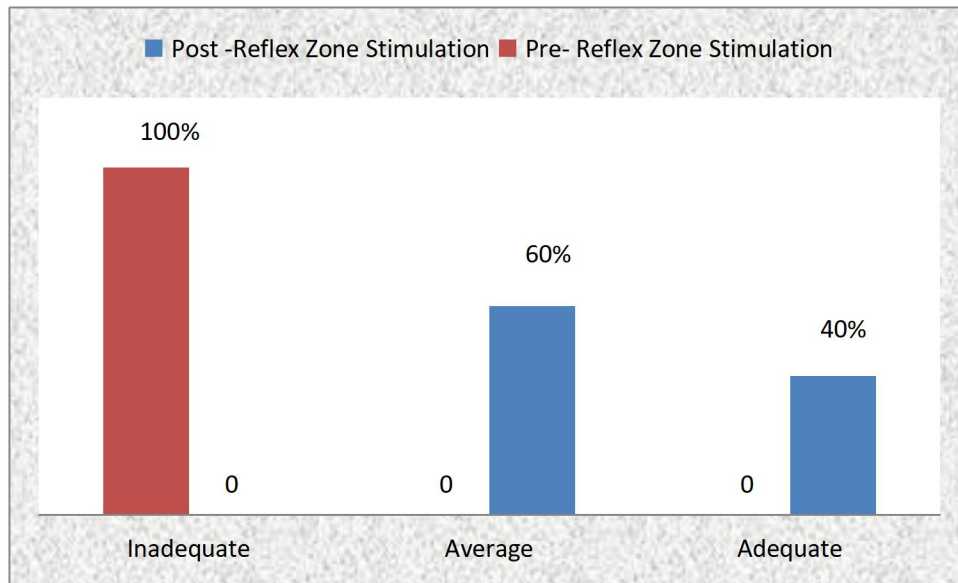
Demographic data	Frequency	Percentage
<b>Age of the mothers(in years):</b>		
Below 20 years	12	12.0
21-25 years	53	53.0
26-30 years	28	28.0
Above 30 years	7	7.0
<b>Educational status :</b>		
Illiterate	62	62.0
secondary	10	10.0
university	20	20.0
Postgraduate	8	8.0
<b>Occupation :</b>		
Housewife	74	74.0
Working	26	26.0
<b>Residence :</b>		
Urban	48	48.0
Rural	52	52.0

Table 2. The postnatal lactation failure mothers distribution regarding their obstetric and postnatal data (n=100)

Demographic variables	Frequency	Percentage
<b>Parity :</b>		
Primi mothers	44	44.0
Multi mothers	56	56.0
<b>Type of delivery:</b>		
LSCS	42	42.0
Normal vaginal delivery	58	58.0
<b>History of abortion :</b>		
Yes	15	15.0
No	85	85.0
<b>Family history of lactation insufficiency :</b>		
Yes	4	4.0
No	96	96.0
<b>Nature of marriage :</b>		
Consanguineous marriage	10	10.0
Non-contagious marriage	90	90.0
<b>Duration of marriage:</b>		
1-2 years	32	32.0
2-3 years	18	18.0
3-4 years	10	10.0
More than 4 years	40	40.0

**Table 3: Comparison between pre and post-Reflex Zone Stimulation scores regarding the level of lactation among lactation failure mothers.**

Level of lactation	Pre Reflex Zone Stimulation		Post Reflex Zone Stimulation		P- value
	No	%	No	%	
Inadequate	100	100	0	0.0	<0.001**
Average	0	0.0	60	60.0	
Adequate	0	0.0	40	40.0	



**Figure 1: Total level of lactation among lactation failure mothers pre and post-reflex Zone Stimulation scores.**

**Table 4: Differences in mean scores of Pre and Post Reflex Zone Stimulation in the level of lactation among lactation failure mothers.**

Overall	Pre Reflex Zone Stimulation			Post Reflex Zone Stimulation			Effectiveness in mean%
	Mean	SD	Mea%	Mean	SD	Mean %	
	5.6	1.77	22	19.88	2.78	72	

**Table: 5 Paired ‘t’-test scores of Pre and Post Reflex Zone Stimulation of level of lactation among lactation failure mothers.**

Overall	Post Reflex Zone Stimulation		Pre Reflex Zone Stimulation		Mean difference	'to-value	P-value
	Mean	SD	Mean	SD			
	19.92	2.22	5.3	1.69			

\*-p<0.05 , significant and \*\*-p<0.01 and \*\*\*-p<0.001, highly significant

**Discussion:**

Zone reflex simulation is a useful tool for helping mothers relax so that their bodies, minds, and spirits may be more supported, which in turn helps initiate and sustain nursing. In addition, regarding postpartum massage and

therapeutic Zone reflex simulation, Laura Thomas mentions research where participants who got ten therapeutic Zone reflex simulation treatments saw an 86 percent rise in milk supply. In addition to the well-known benefits of Zone reflex simulation for boosting milk supply, it also helps new mothers relax and facilitates nursing (Amanda, 2020).



The results of the current study revealed that all of the lactation-failure mothers had insufficient lactating before Reflex Zone Stimulation. From the researcher's point of view, it can be related to several reasons why lactation fails and examined how these reasons are related to other variables. 80% of the time, inadequate or nonexistent milk was the main cause of lactation failure. Lactation failure was associated with factors such as the mother's age, parity, education, socioeconomic status, religion, family structure, and urban versus rural status (**Siu-lan, 2021**).

**Zhang, (2020)** carried out a study to determine the causes, of 670 mothers who were interviewed. According to the data, lactation failure caused by stress and anxiety was the primary cause of breastfeeding failure, with mothers from lower socioeconomic class and less educated having greater success than moms from upper socioeconomic class or with higher education ( $p < 0.01$ ). The study found that urban women should receive education on how to manage and prevent breastfeeding failure brought on by stress and anxiety.

The scientist therefore thinks that all postnatal mothers may experience stress of some kind throughout the postnatal phase for a variety of reasons that may arise during labor and that this stress in turn suppresses the beginning and maintenance of lactation. The mother may also encounter the problem of lactation insufficiency (**Deepak& AkoijamMamata, 2021**).

The results of the current study revealed that there was a statistically significant difference between the pre and post-reflex Zone Stimulation scores. From the researcher's point of view, it reflected the positive effects of Reflex Zone Stimulation and effectively increased the level of lactation.

The efficacy of therapeutic reflexology in promoting breastfeeding and augmenting lactation was evaluated by **Laura Thomas et al., (2020)**. A comparison of expressed milk volume before and after the reflexology treatments was used to examine the effect of the treatments on breastfeeding. Each research participant in this study received 10 therapeutic reflexology treatments. The total rise in the volume of milk produced for the research participants was 88 %. Additionally, the therapies aided in boosting happiness and confidence in nursing. Consequently, it can be said that therapeutic reflexology relieves stress, promotes hormonal balance, and nurtures the body, mind, and spirit—all of which contribute to the resolution of the issue of inadequate milk supply. According to the researcher's findings, reflex zone

stimulation was used during the intervention. In addition to giving mothers a sense of relaxation, May stimulates their nerves by massaging pressure spots. This helps to initiate and maintain lactation, which ensures that the baby receives enough milk.

The results of the current study revealed that the mean value before Reflex Zone Stimulation was 5.6, with a standard deviation of 1.77. However, the mean value after Reflex Zone Stimulation is 19.88, with a standard deviation of 2.78. Thus, it has been discovered that reflex zone stimulation works well for both starting and continuing lactating. The level of lactation failure gets reduced and is effective after the reflex zone stimulation. The mean value is 0.9875, and in the posttest, the mean level is 10.578. **Siu-Lan, (2021)** conducted an experimental study to assess the Galactagogue effect of foot reflexology in China. The study sample consists of 217 parturient women. A treated group of 100 was given a foot massage within 30 hours after delivery. Among them, 17 were given foot massages after 30 hours, but within 120 hours for 10 to 15 minutes a day. No treatment was given to a group of 100 women. The foot massage was found helpful contrary to drugs in lactation, which is considered harmful to the baby.

The results of the current study revealed that results for lactation failure mothers' pre- and post-Reflex Zone Stimulation levels with a statistical mean difference between before and post-Reflex Zone Stimulation. Hence, reflex zone stimulation is a supportive intervention that is harmless to the mother, stimulates the pituitary gland to secrete hormones for milk production, and promotes effective results towards initiation and maintenance of lactation.

This result is supported by **Valiani et al., (2020)** who conducted a study in Iran about "Reviewing the effect of reflexology on the pain and certain features and outcomes of the labor on the primiparous women." And found that reflex zones help with the initiation and maintenance of lactation. Furthermore, **Nurturing and supporting womanhood (2021)** reported the same results.

Also, **Bernardo, (2021)**. Found that Reflex Zone Stimulation reduces the level of lactation failure. Similarly, **LoganayagiK et al., (2021)** studied "Effectiveness of reflex zone therapy among primiparae " and found that reflex zone therapy improves labor pain and lactation among the studied sample.

### **Conclusion:**

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According to the outcomes of the current study, it can be concluded that reflex zone stimulation intervention has a positive effect on maintenance and initiation of lactation among lactation failure mothers.

#### Recommendations:

**The following suggestions are made based on the current study's findings:**

- Providing training regarding reflex zone stimulation to help maintain and initiation of lactation among lactation failure mothers which should be recommended in either clinical or community settings.
- A post-natal in-service education program for maternity nurses should be developed to expand their expertise in reflex zone stimulation as a complementary intervention to help maintain and initiate lactation among lactation-failure mothers.
- Future studies and repeating this study on a large sample size for generalization.

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