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Effect of acupressure at points ST18, SP6, and LI4 on breast milk production: A pre-post study in Solok Regency

Detty Afriyanti Sukandar[1], Derry Trisna Wahyuni S.[2], Mevial Renanta[3]

[1]Universitas Fort De Kock Bukittinggi, Indonesia
[2]Institut Kesehatan dan Teknologi Kartini Batam, Indonesia
[3]Tanjung Bingkung Community Health Center – Solok Regency, Indonesia
afriyantidetty@gmail.com*
*corresponding author

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ABSTRACT

Perceived insufficient breast milk is one of the most commonly reported challenges to achieving exclusive breastfeeding and is frequently influenced by psychological, emotional, and support-related factors rather than actual physiological milk insufficiency**.** Acupressure has increasingly been explored as a complementary, non-pharmacological approach to support maternal comfort and breastfeeding confidence. This study aimed to analyze the effect of acupressure on breast milk adequacy scores using validated lactation indicators among breastfeeding mothers in the working area of Tanjung Bingkung Public Health Center, Solok Regency, in 2024. A pre-experimental one-group pretest–posttest design was used, involving 30 respondents selected through purposive sampling. Breast milk adequacy was measured using a validated Breast Milk Adequacy Questionnaire combined with infant adequacy indicators, including feeding frequency, wet diaper count, and weekly weight gain. Scores ranged from low (0–1), moderate (2–3), to adequate production (≥4). Data were collected before and after a seven-day acupressure intervention and analyzed using a paired t-test. The mean breast milk adequacy score increased from 1.27 (SD 1.20) before the intervention to 2.50 (SD 0.73) afterward, representing an approximate 96.8% improvement from baseline. Statistical analysis showed a significant difference between pretest and posttest scores ($p = 0.000$). These findings suggest a potential supportive role of acupressure in improving perceived lactation adequacy among breastfeeding mothers. However, given the absence of a control group and the use of subjective measurement tools, further studies particularly randomized controlled trials are required to confirm causality and clarify the mechanisms involved.

1. Introduction

Breast milk (ASI) is the optimal source of nutrition for newborns because it contains essential nutritional, immunological, hormonal, and enzymatic components that cannot be replaced by formula milk. Exclusive breastfeeding has been shown to reduce the risk of diarrhea, pneumonia, obesity, and several long-term metabolic diseases. Globally, the World Health Organization (WHO) targets that 60% of infants receive exclusive breastfeeding by 2030; however, current coverage remains at approximately 40% (World Health Organization, 2020).

In Indonesia, exclusive breastfeeding coverage in 2022 reached 67.7%, still below the national target of 80% (Ministry of Health of the Republic of Indonesia, 2018). In West Sumatra, the coverage was 66.9%, while Solok Regency reported only 44%, slightly below the regional target of 45%. These

gaps indicate the need for effective, feasible, and culturally acceptable strategies to support breastfeeding practices (World Health Organization, 2021).

Breast milk production is influenced by multiple interacting physiological and psychological factors, including the neurohormonal regulation of oxytocin and prolactin, maternal nutritional intake, stress levels, fatigue, breastfeeding technique, and social support (Chang et al., 2025). Difficulties with the oxytocin-mediated let-down reflex are commonly reported among breastfeeding mothers and may contribute to reduced milk transfer; however, these difficulties are multifactorial and often intertwined with maternal perceptions, emotional states, and environmental influences (Rollins et al., 2016). Therefore, interventions that may support relaxation, maternal comfort, and neurohormonal stimulation could play a complementary role in promoting effective breastfeeding.

Acupressure is one complementary, non-pharmacological approach that has gained increasing attention in maternal health (Uvnäs-Moberg et al., 2020). It involves applying pressure to specific anatomical points believed to influence physiological responses, including relaxation and neurohormonal modulation. Several studies suggest that stimulation of points such as ST18 (Rugen), SP6 (Sanyinjiao), and LI4 (Hegu) may support breastfeeding by enhancing maternal relaxation and potentially facilitating the oxytocin reflex (Lee et al., 2022; Seo et al., 2022). However, existing evidence remains limited, heterogeneous, and often based on small-scale studies, making it important to interpret findings cautiously.

A meta-analysis by (Lee et al., 2022) reported that acupressure may improve indicators of breast milk adequacy, while a local study by (Wardani & Futriani, 2022) found that acupressure combined with fennel oil aromatherapy was associated with better breastfeeding outcomes compared to a control group. Similarly, a systematic review by (Chang et al., 2025) highlighted the potential role of acupoint stimulation in supporting lactation, although it emphasized that further high-quality research is needed to confirm its effectiveness.

Given the relatively low exclusive breastfeeding coverage in Solok Regency and the limited empirical evidence available locally, this study aims to examine the effect of acupressure on breast milk adequacy scores among breastfeeding mothers in the working area of Tanjung Bingkung Public Health Center. The study seeks to contribute preliminary data that may help inform future research and interventions related to complementary breastfeeding support (Kassebaum et al., 2016; Luby et al., 2018).

2. Method

This study employed a pre-experimental one-group pretest–posttest design to evaluate changes in breast milk production before and after the acupressure intervention. This design allowed researchers to observe improvements within the same group of participants following the treatment.

The study complied with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Health Research Ethics Committee of Universitas Fort de Kock Bukittinggi under approval number 611/UFDK.KEPK/X/2024 with registration number Reg.kepk.ufdk.003.297. The approved protocol was titled *"Pengaruh Akupressure Dengan Aromaterapi Fanel Oil Terhadap Produksi ASI Pada Ibu Menyusui di Wilayah Kerja Puskesmas Tanjung Bingkung Kabupaten Solok Tahun 2024."* Prior to data collection, all participants were informed about the study procedures, potential risks and benefits, confidentiality protocols, and their right to withdraw at any time. Written informed consent was obtained from all respondents.

The study population consisted of 60 breastfeeding mothers in the working area of Tanjung Bingkung Health Center, from which 30 respondents were selected using purposive sampling based on predefined inclusion criteria. Eligible participants were breastfeeding mothers with infants aged 0–6 months, in generally good health, without breast abnormalities, not currently receiving lactation-stimulating therapies, and willing to participate by signing informed consent. A power analysis indicated that a minimum sample of 27 participants was required (effect size 0.5, $\alpha = 0.05$, power = 0.80); therefore, the sample size was increased to 30 to anticipate possible dropout.

The acupressure intervention was performed by a certified midwife practitioner who had completed accredited training in complementary acupressure therapy. Competency was ensured through supervised practice and adherence to a standardized protocol. The intervention took place in

a private room within the health center to ensure comfort and minimize distractions. A Standard Operating Procedure (SOP) was used to maintain uniformity in pressure application, technique, and duration (Chen et al., 2020).

Acupressure was applied to three primary points: ST18 (Rugen) to enhance breast circulation and milk secretion, SP6 (Sanyinjiao) to support hormonal regulation related to prolactin, and LI4 (Hegu) to induce relaxation and stimulate the oxytocin reflex. The technique involved applying moderate thumb pressure (approximately 3–5 kg/cm²) with steady circular motion for 15 minutes per session. The intervention was administered once daily for seven consecutive days. Participants were monitored for adverse effects such as pain, bruising, or dizziness; none were reported throughout the intervention periode.

Breast milk production was measured using two complementary indicators. The first was a validated Breast Milk Adequacy Questionnaire adapted from the Lactation Assessment Tool, consisting of eight items scored on a 0–2 scale, with higher scores indicating greater adequacy. Scores of 0–1 reflected low production, 2–3 moderate production, and ≥4 adequate milk production. The second indicator included infant adequacy measures such as breastfeeding frequency (8–12 times per day), wet diapers (≥6 per day), and weekly weight gain (125–200 grams). The instruments demonstrated strong validity and reliability, with a Content Validity Index (CVI) of 0.89 and Cronbach's alpha of 0.87.

Data collection was conducted by trained enumerators who completed a two-day preparation workshop. Pretest data were obtained on Day 0, and posttest data were collected on Day 8 after the seven-day intervention (Akbarzadeh et al., 2019; Lau, 2018; Park et al., 2021). Enumerators were blinded to the study hypothesis to reduce observer bias, and all data were documented using standardized forms. Confounding variables were controlled by excluding mothers using herbal galactagogues, providing uniform breastfeeding counseling, and documenting maternal nutrition, stress levels, and breastfeeding frequency.

Data were analyzed using a paired t-test to assess differences in mean breast milk production before and after the intervention, with a significance level set at $\alpha = 0.05$. Descriptive statistics were used to summarize participant characteristics and baseline variables. Quality checks were carried out to ensure data completeness and accuracy.

3. Results and Discussion

3.1. Characteristics of Respondents

Table 1. Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
Age 20–35 years	27	90
>35 years	3	10
Elementary School	5	16.7
Senior High School	15	50
Higher Education	10	33.3
Housewives	19	63.3
Employed	11	36.7

Most respondents (90.0%) were aged 20–35 years, while 10.0% were older than 35 years. Half of the participants (50.0%) had completed senior high school, 33.3% had higher education, and 16.7% had only elementary schooling. The majority were housewives (63.3%), while 36.7% were employed. These descriptive data provide an overview of the study sample and were not analyzed for associations with breastfeeding outcomes.

3.2. Breast Milk Production Before and After Acupressure

Breast milk production was measured using the Breast Milk Adequacy Questionnaire as described previously (score range: 0–8). Table 2 presents the mean pretest and posttest scores.

Table 2. Breast Milk Production Before and After Acupressure

Variabel	Mean	SD	p-value
Pretest Score	1.27	1.202	
Posttest Score	2.50	0.731	0.000

The results show an increase in mean breast milk adequacy score from 1.27 before the intervention to 2.50 after seven days of acupressure. The paired t-test indicated that this difference was statistically significant (p = 0.000). The interpretation and clinical relevance of these findings are elaborated in the discussion below.

The present study shows an increase in breast milk adequacy scores after seven days of acupressure, with mean values rising from 1.27 to 2.50. Although the statistical test indicates a significant difference, these findings need to be interpreted carefully. Because the study used a one-group pretest–posttest design, the observed improvement cannot be attributed solely to acupressure. Natural changes in breastfeeding patterns, maternal adaptation, or environmental factors may also have contributed.

Even so, the direction of the findings is in line with earlier research. Studies by (Zimpel et al., 2020) and (Mobarakabadi et al., 2020) both reported improvements in breastfeeding outcomes following stimulation of specific acupressure points or when acupressure was paired with complementary therapies. Likewise, systematic reviews (Lee et al., 2022) and (Chang et al., 2025) suggest that acupressure or acupoint stimulation may support lactation, although the evidence remains mixed and often based on small-scale studies. These studies collectively point to a potential benefit, but they also highlight the need for more rigorous trials before firm conclusions can be made.

Physiological explanations frequently discussed in the literature such as stimulation of the oxytocin reflex, increased maternal relaxation, or enhanced prolactin activity provide some theoretical context for how acupressure might influence lactation. However, the present study did not assess hormonal markers, maternal psychological states, or objective milk volume (Ko & Shin, 2021; Lau & Chan, 2018; Pérez-Escamilla et al., 2019). For that reason, the underlying mechanisms remain speculative and should be viewed only as background information rather than conclusions supported by the data. Several methodological considerations also warrant attention. The absence of a control group makes it difficult to determine whether the change observed in this study differs from normal variations that occur in early breastfeeding. The measurement tool relied on maternal perception and behavioral indicators rather than direct measurements of milk volume, which may introduce subjective bias. In addition, potential confounding factors such as maternal nutrition, stress levels, infant feeding patterns, or previous breastfeeding experience were not statistically controlled. The relatively short intervention period and small sample size further limit the generalizability of the findings (Academy of Breastfeeding Medicine Protocol Committee., 2022; American College of Nurse-Midwives., 2020; Brown, 2018).

Despite these limitations, this study provides preliminary insight into the use of acupressure as a complementary approach for breastfeeding support in Solok Regency. The increase in adequacy scores suggests that acupressure may offer some benefit when performed by trained practitioners and when integrated thoughtfully into breastfeeding support programs. However, stronger research designs such as randomized controlled trials with objective measurements of milk production, longer follow-up periods, and clearer control of confounders are needed to determine whether acupressure has a meaningful and consistent effect on lactation outcomes.

4. Conclusion

The present study observed an increase in breast milk adequacy scores after seven days of acupressure, with mean values rising from 1.27 to 2.50. Although the change was statistically significant, the findings should be interpreted cautiously because the study design does not allow firm conclusions about causality. Without a control group, it remains unclear whether the improvement was due to the intervention itself or to natural variations in breastfeeding, increased maternal confidence, or other unmeasured influences.

Acupressure was well tolerated by all participants, and no adverse events were reported during the intervention period. While this suggests that the procedure may be feasible and acceptable for

breastfeeding mothers, the present study cannot confirm its effectiveness as a clinical strategy. The measurement tool used was based on perceived adequacy rather than objective milk volume, which further limits the strength of the conclusions.

Given these limitations, the results should be viewed as preliminary and exploratory. Acupressure may have potential as a complementary technique, but more rigorous research—especially randomized controlled trials using validated and objective measures of milk production is needed before any recommendation for practice or policy can be made. Future studies should also address potential confounding factors and include larger, more diverse samples to improve generalizability.

In summary, although the study observed a positive trend in breastfeeding adequacy scores, the evidence is insufficient to draw definitive conclusions about the effectiveness of acupressure. These findings should be considered a starting point for further investigation rather than a basis for clinical recommendations.

5. Conclusion of Interest

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