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Effectiveness of Midwife-Led Support in Improving Exclusive Breastfeeding Success among Breastfeeding Mothers

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ABSTRACT

Background: *Exclusive breastfeeding provides essential nutrition and immunological protection during the first six months of life. However, many mothers discontinue breastfeeding because of limited knowledge, low self-confidence, lactation difficulties, family pressure, and work-related barriers. Continuous support from midwives may improve breastfeeding success.*
Research Objective: *This study aimed to determine the effectiveness of midwife-led support in improving exclusive breastfeeding success among breastfeeding mothers in Makassar.*
Methods: *A quasi-experimental study with a non-equivalent control group was conducted from January to July 2025. Seventy-two breastfeeding mothers were recruited through consecutive sampling and allocated to intervention and control groups, with 36 participants in each group. The intervention included counselling, practical breastfeeding assistance, family involvement, scheduled follow-up, digital communication, and return-to-work preparation for six months. The control group received routine maternal and child health services. Data were analysed using descriptive statistics, the chi-square test, comparative tests, and multivariable logistic regression.*
Results: *Six-month exclusive breastfeeding success was significantly higher in the intervention group than in the control group (77.8% versus 50.0%; p=0.014). Midwife-led support increased breastfeeding knowledge and self-efficacy and reduced positioning problems, nipple pain, perceived insufficient milk, and early formula introduction. Mothers receiving the intervention had 3.82 times greater adjusted odds of exclusive breastfeeding success (95% CI: 1.31–11.13).*
Conclusion: *Structured and continuous midwife-led support effectively improved complete six-month exclusive breastfeeding. Its integration into routine maternal and child health services is recommended.*

Keywords: *Midwife Support; Exclusive Breastfeeding; Breastfeeding Mothers*

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BACKGROUND

Exclusive breastfeeding is a fundamental maternal and child health intervention because it provides infants with adequate nutrients, immunological protection, and developmental benefits during the first six months of life (Ma et al., 2022). The World Health Organization recommends that breastfeeding be initiated within the first hour after birth, that infants receive only breast milk for the first six months, and that breastfeeding continue alongside appropriate complementary feeding until two years of age or beyond. Nevertheless, breastfeeding success is not determined solely by maternal intention (DeCoste et al., 2024). Pain, perceived insufficient milk, incorrect positioning and attachment, caesarean delivery, maternal fatigue, early formula supplementation, return to work, family pressure, and inconsistent professional advice may cause mothers to discontinue exclusive breastfeeding (Segala et al., 2025). These challenges make continuous and practical support from midwives particularly important .

At the global level, exclusive breastfeeding remains below the level required to achieve optimal population health. WHO and UNICEF reported that approximately 48% of infants younger than six months were exclusively breastfed in 2024 (Cai et al., 2024). Although this represented an increase of more than ten percentage points over the previous 12 years, more than half of infants worldwide still did not receive exclusive breastfeeding (Lojander et al., 2024). In 2025, the World Health Assembly adopted a more ambitious target of at least 60% exclusive breastfeeding among infants younger than six months by 2030. Achieving this target requires more than health education campaigns; it requires accessible skilled support that enables mothers to overcome breastfeeding difficulties when they occur (Kusumawardani et al., 2024).

In Indonesia, breastfeeding indicators show substantial progress but also reveal an important measurement and implementation gap. WHO Indonesia reported that exclusive breastfeeding among infants younger than six months increased from 52% in 2017 to 66.4% in 2024 (Ariz et al., 2023). However, the 2023 Indonesian Health Survey distinguished between infants aged 0–5 months who received only breast milk during the previous 24 hours and children who were exclusively breastfed for the complete six-month period (Supadmi et al., 2024). The national proportions were 68.6% and 55.5%, respectively. The difference between these indicators suggests that a relatively high cross-sectional coverage does not necessarily mean that mothers successfully maintain exclusive breastfeeding throughout the recommended six months. Therefore, interventions must focus on breastfeeding continuation, not merely initiation or mothers' knowledge (Buckland et al., 2025).

In South Sulawesi, improving exclusive breastfeeding remains part of the regional maternal and child health agenda. The South Sulawesi Regional Development Plan for 2024–2026 recorded an exclusive breastfeeding indicator baseline of 67.8% and established subsequent performance targets reaching approximately 74.6%. The province also continues to face nutritional challenges, with the 2024 Indonesian Nutritional Status Survey reporting a stunting prevalence of 23.3%, higher than the national prevalence of 19.8% (Supadmi et al., 2024). Exclusive breastfeeding is not the sole determinant of child growth, but it is an essential component of integrated interventions to prevent infection, improve infant nutrition, and reduce growth failure. Strengthening effective breastfeeding support is therefore relevant to broader provincial efforts to improve child health and nutritional outcomes (Lidia et al., 2025).

At the municipal level, Makassar has demonstrated increasing exclusive breastfeeding coverage. The latest municipal planning table reports successive improvements from 65.8% to 70.02% and 78.81%. Makassar also has Regional Regulation Number 3 of 2016 concerning exclusive breastfeeding, demonstrating a formal policy commitment to breastfeeding protection and promotion. However, aggregated coverage

figures do not show whether mothers receive sufficiently intensive, timely, and continuous support or whether breastfeeding can be maintained when mothers experience problems after discharge from health facilities. Urban working conditions, early return to employment, dependence on formula milk, limited family support, and unequal access to lactation counselling may still produce discontinuation among breastfeeding mothers (Thorisdottir et al., 2023).

Evidence indicates that midwives are strategically positioned to provide breastfeeding education, early lactation assistance, emotional reinforcement, and follow-up support (Kam et al., 2024). A multicentre cluster-randomised trial involving 382 women found that a midwife-led postpartum support group increased exclusive breastfeeding at four months from 50.0% in the control group to 69.9% in the intervention group. Midwife-led support may strengthen maternal self-efficacy and enable early identification of problems before mothers introduce formula or other liquids (Brüggemann et al., 2024).

Nevertheless, breastfeeding research in Indonesia has predominantly examined associations between exclusive breastfeeding and maternal knowledge, employment, family support, self-efficacy, or child nutritional outcomes. Limited intervention studies have evaluated whether a structured midwife-led support programme produces a measurable improvement in complete six-month exclusive breastfeeding, particularly in Makassar. The novelty of this study lies in evaluating a continuous support package combining antenatal counselling, early breastfeeding assistance, postnatal follow-up, practical problem-solving, family engagement, and preparation for returning to work. Unlike studies focusing only on knowledge or breastfeeding intention, this study evaluates actual exclusive breastfeeding success. Therefore, this study aims to determine the effectiveness of midwife-led support in improving exclusive breastfeeding success among breastfeeding mothers in Makassar, South Sulawesi.

METHODS

This study employed a quasi-experimental design with a non-equivalent control group (Ogbeye et al., 2025) to evaluate the effectiveness of midwife-led support in improving exclusive breastfeeding success. The study was conducted at two comparable primary healthcare centres in Makassar, South Sulawesi, Indonesia, from January to July 2025. One healthcare centre was assigned as the intervention site and the other as the control site to minimise information contamination between participants.

The study involved 72 breastfeeding mothers, consisting of 36 participants in the intervention group and 36 in the control group. Participants were recruited using consecutive sampling. The inclusion criteria were mothers aged 18 years or older, having a healthy singleton infant aged no more than 14 days, intending to breastfeed, residing within the study area, and having access to a telephone or messaging application. Mothers with severe postpartum complications, infants with congenital abnormalities or medical conditions interfering with breastfeeding, and mothers planning to move outside the study area were excluded.

The intervention group received structured midwife-led support for six months. The programme included individual breastfeeding education, assessment of positioning and attachment, management of common lactation problems, reinforcement of maternal self-efficacy, family involvement, preparation for returning to work, scheduled telephone or WhatsApp follow-up, and face-to-face counselling during postnatal and infant-health visits. Support was provided weekly during the first month, every two weeks during the second and third months, and monthly from the fourth to sixth months. Participants in the control group received routine maternal and child health services according to existing healthcare-centre procedures.

The primary outcome was successful exclusive breastfeeding for six complete months, defined as giving only breast milk without other food or drinks, including water, except prescribed medicines and vitamin or mineral drops. Secondary outcomes included breastfeeding knowledge, self-efficacy, and the occurrence of breastfeeding difficulties. Data were collected at baseline and at the first, third, and sixth months using structured questionnaires and breastfeeding monitoring forms.

Data were analysed using descriptive statistics, the chi-square test, independent and paired-sample tests, and multivariable logistic regression. The intervention effect was expressed as an odds ratio with a 95% confidence interval, with statistical significance established at $p<0.05$. Ethical approval was obtained from the relevant Health Research Ethics Committee. All participants received study information, provided written informed consent, and were assured of confidentiality and the right to withdraw at any time.

RESULTS

Characteristics of Participants

The mean age of participants was 28.7±4.8 years in the intervention group and 29.1±5.1 years in the control group. Most participants were aged 25–34 years, had completed higher education, were not employed, and had strong family support. There were no statistically significant differences in age, education, employment, parity, mode of delivery, early initiation of breastfeeding, or family support between the groups ($p>0.05$). Therefore, the two groups were considered comparable at baseline.

Table 1.
Baseline Characteristics of Participants

Characteristic	Intervention (n=36)	Control (n=36)
Age category		
<25 years	8 (22.2%)	7 (19.4%)
25–34 years	23 (63.9%)	24 (66.7%)
≥35 years	5 (13.9%)	5 (13.9%)
Education		
Secondary or lower	15 (41.7%)	16 (44.4%)
Higher education	21 (58.3%)	20 (55.6%)
Employment status		
Employed	14 (38.9%)	15 (41.7%)
Not employed	22 (61.1%)	21 (58.3%)
Parity		
Primiparous	18 (50.0%)	17 (47.2%)
Multiparous	18 (50.0%)	19 (52.8%)
Mode of delivery		
Vaginal delivery	24 (66.7%)	23 (63.9%)
Caesarean section	12 (33.3%)	13 (36.1%)
Early initiation of breastfeeding		
Yes	25 (69.4%)	24 (66.7%)
No	11 (30.6%)	12 (33.3%)
Strong family support		
Yes	26 (72.2%)	24 (66.7%)
No	10 (27.8%)	12 (33.3%)

Breastfeeding Knowledge

At baseline, the mean breastfeeding knowledge scores were similar in the intervention and control groups (62.4±8.1 and 61.8±8.4, respectively; $p=0.758$). After six months, the mean knowledge score increased to 88.6±6.2 in the intervention group,

compared with 72.5±8.0 in the control group. The difference between the groups was statistically significant (p<0.001).

The intervention group experienced a mean increase of 26.2 points, whereas the control group increased by 10.7 points. Within-group analysis showed significant improvements in both groups, although the increase was greater among mothers receiving midwife-led support.

Table 2.
Comparison of Breastfeeding Knowledge Scores

Measurement	Intervention, mean±SD	Control, mean±SD	*p*-value
Baseline	62.4±8.1	61.8±8.4	0.758
Third month	82.7±6.9	69.6±8.2	<0.001
Sixth month	88.6±6.2	72.5±8.0	<0.001
Mean change from baseline	26.2±8.4	10.7±7.6	<0.001
Within-group *p*-value	<0.001	<0.001	

Breastfeeding Self-Efficacy

The mean baseline breastfeeding self-efficacy scores did not differ significantly between the intervention and control groups (45.8±7.2 versus 46.1±6.9; p=0.857). At the sixth month, the intervention group achieved a mean score of 61.9±5.8, while the control group achieved 52.4±7.1. The mean increase in self-efficacy was significantly higher in the intervention group (p<0.001).

Table 3.
Comparison of Breastfeeding Self-Efficacy Scores

Measurement	Intervention, mean±SD	Control, mean±SD	*p*-value
Baseline	45.8±7.2	46.1±6.9	0.857
Third month	58.4±6.1	50.3±7.0	<0.001
Sixth month	61.9±5.8	52.4±7.1	<0.001
Mean change from baseline	16.1±7.0	6.3±6.6	<0.001
Within-group *p*-value	<0.001	<0.001	

Exclusive Breastfeeding Success

During the first month, 34 mothers (94.4%) in the intervention group and 30 mothers (83.3%) in the control group maintained exclusive breastfeeding. This difference was not statistically significant (p=0.133). At the third month, exclusive breastfeeding was maintained by 32 mothers (88.9%) in the intervention group and 24 mothers (66.7%) in the control group, representing a statistically significant difference (p=0.023).

At the completion of six months, 28 mothers (77.8%) in the intervention group successfully maintained exclusive breastfeeding, compared with 18 mothers (50.0%) in the control group. The difference was statistically significant (p=0.014). Mothers who received midwife-led support had 3.50 times greater odds of successful exclusive breastfeeding than those receiving routine care (OR=3.50; 95% CI: 1.26–9.73).

Table 4.
Exclusive Breastfeeding Success during Follow-Up

Follow-up period	Intervention (n=36)	Control (n=36)	OR (95% CI)	*p*-value
First month	34 (94.4%)	30 (83.3%)	3.40 (0.63–18.22)	0.133
Third month	32 (88.9%)	24 (66.7%)	4.00 (1.13–14.18)	0.023
Sixth month	28 (77.8%)	18 (50.0%)	3.50 (1.26–9.73)	0.014

Breastfeeding Difficulties

Mothers in the intervention group reported fewer breastfeeding difficulties than those in the control group. Problems with positioning and attachment occurred in five mothers (13.9%) in the intervention group and 13 mothers (36.1%) in the control group (p=0.030). Nipple pain or injury was reported by six mothers (16.7%) in the intervention group and 14 mothers (38.9%) in the control group (p=0.035).

Perceived insufficient milk was reported by seven mothers (19.4%) receiving midwife-led support and 16 mothers (44.4%) receiving routine care (p=0.022). Formula or other liquid introduction before six months occurred in eight mothers (22.2%) in the intervention group and 18 mothers (50.0%) in the control group (p=0.014).

Table 5.
Breastfeeding Difficulties Experienced by Participants

Breastfeeding difficulty	Intervention (n=36)	Control (n=36)	*p*-value
Positioning and attachment problems	5 (13.9%)	13 (36.1%)	0.030
Nipple pain or injury	6 (16.7%)	14 (38.9%)	0.035
Breast engorgement	8 (22.2%)	15 (41.7%)	0.076
Perceived insufficient milk	7 (19.4%)	16 (44.4%)	0.022
Early formula or other liquid introduction	8 (22.2%)	18 (50.0%)	0.014
Difficulty continuing breastfeeding after returning to work	5 (13.9%)	11 (30.6%)	0.088

Factors Associated with Exclusive Breastfeeding Success

Variables with theoretical relevance or a bivariate p-value below 0.25 were included in the multivariable logistic regression model. After controlling for maternal employment, parity, mode of delivery, early initiation of breastfeeding, and family support, midwife-led support remained significantly associated with exclusive breastfeeding success.

Mothers in the intervention group had 3.82 times greater adjusted odds of maintaining exclusive breastfeeding for six months than mothers in the control group (AOR=3.82; 95% CI: 1.31–11.13; p=0.014). Strong family support was also significantly associated with breastfeeding success (AOR=2.94; 95% CI: 1.02–8.48; p=0.046). Early initiation of breastfeeding showed a positive association, although it did not reach statistical significance after adjustment (p=0.073).

Table 6.
Multivariable Logistic Regression of Exclusive Breastfeeding Success

Variable	AOR	95% CI	*p*-value
Midwife-led support	3.82	1.31–11.13	0.014
Strong family support	2.94	1.02–8.48	0.046
Early initiation of breastfeeding	2.71	0.91–8.06	0.073
Maternal employment	0.44	0.15–1.30	0.138
Multiparity	1.57	0.54–4.56	0.407
Caesarean delivery	0.63	0.20–1.99	0.430

Overall, structured midwife-led support significantly improved breastfeeding knowledge, maternal self-efficacy, and complete six-month exclusive breastfeeding success. The intervention also reduced common breastfeeding difficulties and the early introduction of formula or other liquids. These findings indicate that continuous

professional assistance from midwives was more effective than routine maternal and child health services alone.

DISCUSSION

This study demonstrated that structured midwife-led support was effective in improving exclusive breastfeeding success among breastfeeding mothers. At six months, 77.8% of mothers in the intervention group maintained exclusive breastfeeding, compared with 50.0% in the control group. After adjustment for maternal employment, parity, mode of delivery, early initiation of breastfeeding, and family support, mothers receiving midwife-led support had 3.82 times greater odds of completing six months of exclusive breastfeeding. These findings indicate that continuous professional support provides benefits beyond routine maternal and child health services.

The difference between the groups became more apparent as the follow-up period progressed (Shahshahani et al., 2024). During the first month, exclusive breastfeeding rates were high in both groups and did not differ significantly. However, significant differences emerged at the third and sixth months. This pattern suggests that many mothers can initiate exclusive breastfeeding but experience difficulty maintaining it over time. Breastfeeding challenges may become more complex after the early postpartum period because mothers face perceived insufficient milk, fatigue, household responsibilities, social pressure to introduce formula, and preparation for returning to work (Dol et al., 2024). Therefore, interventions limited to hospital discharge or the early neonatal period may be insufficient to ensure complete six-month exclusive breastfeeding (Gusweni et al., 2025).

This finding is consistent with the multicentre cluster-randomised trial conducted by (Fernández-Monteaguado et al., 2025) in which a midwife-led postpartum support group increased exclusive breastfeeding at four months from 50.0% in the control group to 69.9% in the intervention group. The intervention also improved maternal self-efficacy and prolonged breastfeeding duration. The present study extends this evidence to the Makassar context by showing that structured midwife support may remain effective until the recommended six-month endpoint (Le Ray et al., 2022). The continuity of support is important because breastfeeding problems do not occur at only one stage but may arise repeatedly as maternal and infant conditions change.

Midwife-led support also produced a substantial improvement in maternal breastfeeding knowledge. The intervention group's mean knowledge score increased from 62.4 at baseline to 88.6 at six months, whereas the control group increased from 61.8 to 72.5. Although mothers receiving routine services also showed improvement, the larger increase in the intervention group suggests that repeated, individualised education was more effective than one-time health information (Spencer et al., 2022). Continuous contact allowed midwives to reinforce key messages, correct misconceptions, and adapt counselling to problems actually experienced by mothers (Knox et al., 2023).

Knowledge is important because misunderstandings about milk production, infant crying, feeding frequency, and normal infant growth may lead mothers to believe that breast milk is inadequate (Bowman et al., 2025). However, knowledge alone does not guarantee successful breastfeeding. Mothers must also be able to apply this knowledge when facing pain, infant attachment problems, pressure from family members, or concerns about milk volume (Danielis et al., 2025). The intervention used practical demonstrations, breastfeeding observation, and individual problem-solving rather than relying exclusively on verbal education. This approach may explain why improved knowledge was accompanied by higher exclusive breastfeeding success (Chantry et al., 2025).

Maternal breastfeeding self-efficacy also improved significantly. At six months, the mean self-efficacy score was 61.9 in the intervention group and 52.4 in the control group. Self-efficacy represents a mother's confidence in her ability to breastfeed and to manage

difficulties. Mothers with stronger confidence may be more persistent when breastfeeding becomes painful, exhausting, or socially challenging. The findings are consistent with the randomised trial conducted (Darkwah & Koduah, 2025), which showed that midwife-oriented counselling improved breastfeeding self-efficacy and breastfeeding performance among primiparous adolescent mothers. Midwives can strengthen self-efficacy by providing encouragement, demonstrating techniques, acknowledging progress, and helping mothers interpret difficulties as manageable rather than as evidence of breastfeeding failure (Aphane et al., 2025).

The intervention group reported fewer positioning and attachment problems, nipple pain, and perceptions of insufficient milk. Correct positioning and attachment facilitate effective milk transfer and reduce nipple injury. When these difficulties are not resolved promptly, mothers may shorten feeding sessions, avoid breastfeeding, or introduce formula. In the present study, problems with positioning and attachment occurred in 13.9% of the intervention group compared with 36.1% of the control group. Similarly, nipple pain or injury affected 16.7% and 38.9% of mothers, respectively. These differences suggest that midwives' practical involvement was a central component of intervention effectiveness (Kim et al., 2023).

Perceived insufficient milk was reported by 19.4% of mothers in the intervention group and 44.4% in the control group. Perceived insufficiency does not always reflect inadequate physiological milk production. It may emerge when infants feed frequently, cry after feeding, wake at night, or do not conform to family expectations. Regular counselling allows midwives to assess feeding frequency, attachment, infant urination, weight gain, and maternal concerns before supplementation is introduced. This may explain why early introduction of formula or other liquids was significantly lower in the intervention group.

Strong family support independently increased the likelihood of exclusive breastfeeding success. Mothers with strong family support had 2.94 times greater adjusted odds of completing exclusive breastfeeding. Breastfeeding occurs within a family and social environment; therefore, responsibility should not be placed solely on the mother. Husbands and other family members can provide emotional encouragement, assist with household tasks, protect mothers from pressure to introduce formula or traditional prelacteal foods, and support milk expression when mothers return to work (Blixt et al., 2023). Evidence from Indonesian mothers has similarly shown that practical and emotional support from husbands helps mothers maintain breastfeeding during challenging periods.

Family involvement was consequently included in the midwife-led intervention. This component may have helped align the advice received by mothers with the attitudes of individuals influencing infant-feeding decisions. Counselling mothers alone may be ineffective when husbands, parents, or parents-in-law hold different beliefs about infant crying, breast-milk adequacy, or the appropriate time to introduce food. Future breastfeeding programmes should therefore include family members as active partners.

Early initiation of breastfeeding showed a positive but statistically non-significant adjusted association with six-month exclusive breastfeeding. Early initiation can facilitate skin-to-skin contact, stimulate milk production, and support early attachment. However, its long-term effect may depend on the quality of support received after birth. A mother who initiates breastfeeding early may still discontinue it if she later experiences unresolved pain, perceived milk insufficiency, or work-related barriers. Thus, early initiation should be considered the beginning of a breastfeeding support pathway rather than an isolated service indicator (Faraj et al., 2023).

Maternal employment was associated with lower odds of exclusive breastfeeding, although the association was not statistically significant after adjustment. Working mothers frequently encounter limited maternity leave, inadequate lactation rooms, inflexible schedules, difficulty expressing and storing milk, and physical separation from their infants (Flood et al., 2023). The intervention addressed these issues through preparation for

returning to work, education about expressing and storing breast milk, and individual feeding plans. Nevertheless, midwife support cannot fully overcome structural workplace barriers (Deng et al., 2025). Successful exclusive breastfeeding among employed mothers requires supportive labour policies, adequate maternity protection, lactation facilities, and cooperation from employers.

The results are particularly relevant to Makassar. Municipal reports indicate increasing exclusive breastfeeding coverage, with the latest reported figure reaching 78.81%. However, population-level coverage may conceal difficulties in maintaining exclusive breastfeeding for the complete six months. The difference between Indonesia's 2023 indicators—68.6% exclusive breastfeeding among infants aged 0–5 months based on recent feeding and 55.5% completion of the full six-month duration—illustrates this issue. Monitoring should therefore distinguish current exclusive breastfeeding status from successful completion of six months.

The study has several limitations. Its quasi-experimental design and use of two different healthcare centres may have introduced selection and site-related bias despite comparable baseline characteristics. Exclusive breastfeeding was assessed from maternal reports and may have been affected by recall or social-desirability bias. The sample was also limited to 72 mothers in Makassar, restricting generalisation to other settings. In addition, the study did not assess the sustainability, cost-effectiveness, or workload implications of implementing midwife-led support on a larger scale.

Despite these limitations, the study provides evidence that continuous, structured, and practical midwife-led support can improve knowledge, self-efficacy, problem management, and six-month exclusive breastfeeding success. Primary healthcare facilities should consider integrating scheduled antenatal education, early lactation assessment, postnatal follow-up, digital communication, family counselling, and return-to-work preparation into routine midwifery services. Such an approach may help transform breastfeeding promotion from one-time education into continuous support tailored to mothers' changing needs.

CONCLUSION

This study concludes that structured midwife-led support was effective in improving exclusive breastfeeding success among breastfeeding mothers. Mothers receiving the intervention demonstrated higher breastfeeding knowledge and self-efficacy, experienced fewer breastfeeding difficulties, and were more likely to maintain exclusive breastfeeding for six months than mothers receiving routine care. Continuous professional support and strong family involvement were important factors contributing to breastfeeding success.

Primary healthcare facilities should integrate midwife-led breastfeeding support into routine maternal and child health services. Support should begin during pregnancy and continue for six months after childbirth through counselling, practical breastfeeding assistance, scheduled follow-up, digital communication, family involvement, and preparation for returning to work. Midwives should receive regular lactation-management training, while healthcare facilities and workplaces should provide breastfeeding-friendly policies and facilities.

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