

**Differences in Knowledge of Exclusive Breastfeeding Among Postpartum Working Mothers Who Received and Did Not Receive Education in the Working Area of Darussalam Public Health Center, Medan City, North Sumatra, Indonesia**

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**Abstract**

The coverage of exclusive breastfeeding in Indonesia remains suboptimal, particularly among postpartum working mothers who face time constraints and limited knowledge. Personalized Breastfeeding Education (PBE) has emerged as a potential strategy to enhance understanding and improve exclusive breastfeeding practices. This study aimed to determine the difference in knowledge levels regarding exclusive breastfeeding between postpartum working mothers who received and did not receive breastfeeding education in the working area of Darussalam Public Health Center, Medan City. A quasi-experimental study with a non-equivalent control group pre-test–post-test design was conducted involving 140 postpartum working mothers, divided into an intervention group (n=70) and a control group (n=70). The intervention consisted of individual counseling, educational videos, diary books, and interactive discussions conducted over six months. Knowledge was assessed using a structured questionnaire and analyzed with independent t-tests and paired t-tests, with a significance level of  $p < 0.05$ . There was a significant difference in knowledge scores between the intervention and control groups at the first week, third month, and sixth month ( $p = 0.001$ ). Furthermore, a significant increase in knowledge scores was observed within the intervention group before and after receiving the education ( $p = 0.001$ ). Personalized breastfeeding education was proven effective in increasing postpartum working mothers' knowledge about exclusive breastfeeding. Multimodal and context-based interventions should be integrated into maternal health services to support the success of exclusive breastfeeding practices.

**Keywords:** Education, Working Mothers, Exclusive Breastfeeding, Knowledge

**Introduction**

Breastfeeding is a critical factor in improving child health, particularly in enhancing the nutritional status of infants (Balqis et al., 2023). The low rate of exclusive breastfeeding poses a significant threat to child growth and development, potentially affecting the future quality of life and productivity of the nation's next generation (Hossain & Mirshahi, 2022). Infants who do not receive exclusive breastfeeding are at a higher risk of illness compared to those who are exclusively breastfed (Siregar et al., 2022).

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding along with appropriate complementary feeding until the age of two years. However, global and national breastfeeding rates remain far from optimal. The global prevalence of exclusive breastfeeding among infants aged 0–6 months is only 38% (WHO/UNICEF, 2018). In Indonesia, there were 3,196,303 infants under the age of six months in 2020, but only 2,113,564 (66.1%) received exclusive breastfeeding.

Postpartum mothers often fail to exclusively breastfeed due to insufficient milk production and inadequate knowledge about proper breastfeeding techniques (Winarti et al., 2024). According to Marwiyah & Khaerawati (2020), maternal knowledge is one of the most influential factors in the success of exclusive breastfeeding practices. It is therefore essential to equip mothers especially during pregnancy with knowledge about exclusive breastfeeding. Improved maternal knowledge leads to increased awareness and intention to exclusively breastfeed (Lestari, 2023). Proper understanding, particularly of effective breastfeeding techniques, is crucial because behaviors based on knowledge are more likely to be adopted and sustained (Mahayati et al., 2024; Majid et al., 2011). Providing mothers with accurate information and understanding can help foster the desired behaviors in exclusive breastfeeding.

Correct knowledge about breastfeeding can be imparted to mothers and families through antenatal classes or lactation counseling, as implemented by researchers in the working area of Darussalam Public Health Center. However, only a small proportion of mothers and their families participated in such sessions.

Various studies have explored the use of educational interventions such as visual media, printed materials, and videos to improve exclusive breastfeeding (Souza et al., 2020; Huang et al., 2007). However, the development of a breastfeeding diary book as a tool to monitor and evaluate the effectiveness of education is still limited. Without a diary book, breastfeeding education may not be as effective in improving maternal knowledge or exclusive breastfeeding coverage. The diary can serve as a practical tool for tracking maternal knowledge and breastfeeding skills (Astuti et al., 2020).

Mothers who are equipped with sufficient knowledge and skills are more confident in breastfeeding their infants, which significantly enhances the success of exclusive breastfeeding. This study aims to examine the differences in knowledge regarding exclusive breastfeeding among postpartum working mothers who received and did not receive breastfeeding education in the service area of Darussalam Public Health Center, Medan City, North Sumatra, Indonesia.

## **Methods**

This study employed a quasi-experimental design (non-equivalent group, pre-test–post-test design). The research was conducted in the working area of the Darussalam Public Health Center, Medan City, North Sumatra Province, Indonesia, from January to October 2024. The target population consisted of all postpartum working mothers residing in the service area of the Darussalam Public Health Center. A total of 140 participants were selected using purposive sampling and divided into two groups: an intervention group of 70 mothers who received structured and personalized breastfeeding education (Personalized Breastfeeding Education/PBE) delivered by trained midwives during the antenatal or postnatal period, and a control group of 70 mothers who did not receive any breastfeeding education. The sampling criteria included: Inclusion criteria: (1) postpartum mothers employed in formal work settings (with official working hours and direct supervisors), (2) within six months postpartum, and (3) willing to participate. Exclusion criteria: mothers with serious medical conditions, communication barriers, or those unwilling to participate. The exclusive breastfeeding education was delivered through individual counseling sessions, visual videos, and interactive discussions covering the benefits, techniques, and challenges of exclusive breastfeeding, all contextualized to the mothers' working environment. Each session lasted between 45 to 60 minutes and was facilitated by certified and trained midwives.

Data collection was conducted using a validated structured questionnaire adapted from the WHO instrument. The knowledge variable was measured using a 10-item questionnaire

assessing understanding of breastfeeding benefits, proper breastfeeding techniques, duration of exclusive breastfeeding, breastmilk storage, and workplace breastfeeding support. Responses followed a Guttman scale with binary scoring: correct answers scored 1, while incorrect or “don’t know” responses scored 0. Total scores ranged from 0 to 10, with higher scores indicating better knowledge levels. The maternal satisfaction variable was measured using a 6-item Likert-scale questionnaire assessing mothers’ perceptions of exclusive breastfeeding. Responses ranged from Strongly Agree (5) to Strongly Disagree (1), with total scores ranging from 5 to 30, where higher scores reflected higher satisfaction levels. The husband support variable consisted of 29 items adapted from existing instruments measuring paternal support. Responses followed a 5-point Likert scale: Always (5), Often (4), Sometimes (3), Rarely (2), and Never (1). The final score ranged from 5 to 30, with higher scores indicating greater maternal satisfaction with husband support. All data were collected through face-to-face interviews conducted by trained enumerators to minimize bias and ensure respondent comprehension. Data were analyzed using SPSS version 25. The statistical tests used included Chi-square tests, Paired t-tests, independent t-tests, and Repeated Measures ANOVA, with a significance level set at  $p \leq 0.05$ . The study obtained ethical approval from the Human Research Ethics Committee of Universiti Sultan Zainal Abidin (Approval No: UniSZA/UHREC/2023/574). Additionally, permission was obtained from academic authorities and relevant local agencies prior to data collection. Written informed consent was secured from all participants before questionnaire distribution.

## Results and Discussion

### Characteristics of Mothers

The characteristics of postpartum working mothers in the catchment area of Darussalam Community Health Center include variables such as age, education, ethnicity, occupation, type of delivery, maternal health status, and infant health status. The frequency distribution of the sociodemographic characteristics of postpartum working mothers in the Darussalam Community Health Center service area is presented in task 1:

Table 1. Characteristics of the Postpartum Working Mothers

Characteristics		Intervention Group (n=70)		Control Group (n=70)		P Value*
		n	%	n	%	
Age	< 35 years	68	97.1	63	90.0	0.165
	≥ 35 years	2	2.1	7	10.0	
Education	Low	57	81.4	51	72.9	0.314
	High	13	18.6	19	27.1	
Ethnicity	Malay	30	42.9	28	40.0	0.049
	Non-Malay	40	57.1	42	60.0	
Occupation	Civil servant	8	11.4	10	14.3	0.801
	Private employee	62	88.6	60	85.7	
Delivery History	Vaginal delivery	59	84.3	54	77.1	0.392
	Cesarean section	11	15.7	16	22.9	
Maternal Health Status	Good	48	68.6	49	70.0	1.000
	Poor	22	31.4	21	30.0	

\*Chi-square test

Based on the table above, the sociodemographic characteristics of the mothers were as follows: In the intervention group, 68 mothers (97.1%) were aged < 35 years, and 2 mothers (2.9%) were aged ≥ 35 years. In the control group, 63 mothers (90.0%) were aged < 35 years, and 7 mothers (10.0%) were aged ≥ 35 years. The analysis yielded a *p-value* of 0.165, indicating no significant association between maternal age and group assignment.

Regarding education, in the intervention group, 57 mothers (81.4%) had a high level of education, while 13 mothers (18.6%) had a low level of education. In the control group, 51 mothers (72.9%) had a high level of education, and 19 mothers (27.1%) had a low level of education. The *p-value* was 0.314, suggesting no significant relationship between education level and group membership.

Concerning ethnicity, in the intervention group, 30 mothers (42.9%) identified as Malayu, 40 (57.1%) as No Malayu. In the control group, 28 mothers (40.0%) were Malay, 42 (60.0%) No Malayu. The analysis showed a *p-value* of 0.049, indicating a statistically significant association between ethnicity and group allocation.

For occupation, in the intervention group, 8 mothers (11.4%) were civil servants and 62 (88.6%) were private employees. In the control group, 10 mothers (14.3%) were civil servants and 60 (85.7%) were private employees. The *p-value* of 0.801 suggested no significant association between occupation and group.

Regarding delivery history, in the intervention group, 59 mothers (84.3%) had vaginal deliveries, and 11 (15.7%) underwent cesarean sections. In the control group, 54 mothers (77.1%) had vaginal deliveries, and 16 (22.9%) had cesarean sections. The *p-value* was 0.392, indicating no significant relationship between delivery history and group assignment.

In terms of maternal health status, 48 mothers (68.6%) in the intervention group were classified as having good health, while 22 (31.4%) were classified as having poor health. In the control group, 49 mothers (70.0%) had good health status, and 21 (30.0%) had poor health status. The *p-value* was 1.000, indicating no significant association between maternal health status and group. All the *p* value was less than 0.05, indicating no significant association between maternal characteristics and group.

### **Differences in Maternal Knowledge of Exclusive Breastfeeding Between Those Who Received and Did Not Receive Education**

The difference in knowledge regarding exclusive breastfeeding among postpartum working mothers who received and did not receive education in the working area of Darussalam Public Health Center, Medan City, North Sumatra, is presented as follows:

Table 2. Differences in Maternal Knowledge of Exclusive Breastfeeding Between Educated and Non-Educated Mothers in the Working Area of Darussalam Public Health Center, Medan City, North Sumatra

	Intervention Group (n= 70)		Control Group (n= 70)		95% CI	<i>P</i> <i>value</i> *
	Mean	SD	Mean	SD		
Maternal Knowledge						
First Week	6.59	1.302	5.40	2.331	0.555-1.817	0.001
Third Month	7.31	0.910	5.40	2.331	1.323-2.506	0.001
Sixth Month	7.79	0.915	5.40	2.331	1.794-2.977	0.001

\*Uji independent t-test

Based on the table above, the mean maternal knowledge score in the intervention group during the first week was 6.59 with a standard deviation (SD) of 1.302, while the control group had a mean score of 5.40 with an SD of 2.331. A p-value of 0.001 indicates a statistically significant difference in the mean knowledge scores between the intervention and control groups during the first week. In the third month, the intervention group had a mean knowledge score of 7.31 (SD = 0.910), whereas the control group remained at a mean score of 5.40 (SD = 2.331). With a p-value of 0.001, the difference was statistically significant, suggesting that the intervention significantly improved maternal knowledge by the third month. Similarly, in the sixth month, the intervention group demonstrated a further increase in mean knowledge score to 7.79 (SD = 0.915), while the control group remained at 5.40 (SD = 2.331). The p-value of 0.001 confirms a statistically significant difference in maternal knowledge between the two groups at the sixth month.

### Differences in Maternal Knowledge of Exclusive Breastfeeding Before and After Receiving Education in the Intervention Group

The difference in maternal knowledge regarding exclusive breastfeeding before and after receiving education among mothers in the intervention group in the working area of Darussalam Public Health Center, Medan City, North Sumatra, is presented as follows:

Table 3. Differences in Maternal Knowledge of Exclusive Breastfeeding Before and After Receiving Education in the Intervention Group

Maternal Knowledge	N	Mean	SD	SE	P value*
Differences in Maternal Knowledge (Intervention 1)					
Pre-Intervention	70	5.39	2.248	0.269	0.001
First Week		6.59	1.302	0.156	
Differences in Maternal Knowledge (Intervention 2)					
First Week	70	6.59	1.302	0.156	0.001
Third Month		7.31	0.910	0.109	
Differences in Maternal Knowledge (Intervention 3)					
Third Month	70	7.31	0.910	0.109	0.001
Sixth Month		7.79	0.915	0.109	

\*Uji paired t-test

Based on the table above, the mean maternal knowledge score on exclusive breastfeeding prior to the intervention was 5.39 with a standard deviation (SD) of 2.248. In the first week after receiving the intervention, the mean score increased to 6.59 (SD = 0.269). The mean difference between the pre-intervention and first-week scores was -1.200 (SD = 1.281), with a p-value of 0.001, indicating a statistically significant difference in maternal knowledge of exclusive breastfeeding before and after the first week of education. In the second phase, the mean score at week one was 6.59 (SD = 0.269), which further increased to 7.31 (SD = 0.910) by the third month. The mean difference between week one and the third month was -0.729 (SD = 0.779), with a p-value of 0.001, suggesting a significant improvement in maternal knowledge between these two time points.

In the third phase, the mean score in the third month was 7.31 (SD = 0.910), which increased to 7.79 (SD = 0.915) by the sixth month. The mean difference between the third and sixth months was -0.471 (SD = 0.557), and the p-value of 0.001 indicates a statistically significant

increase in maternal knowledge during this period. These findings suggest a consistent and significant improvement in maternal knowledge of exclusive breastfeeding following personalized education over time.

## **DISCUSSION**

Maternal knowledge plays a crucial role in shaping behavior related to breastfeeding success. In reality, mothers with high levels of knowledge may still fail to provide exclusive breastfeeding due to work-related constraints. The ability to breastfeed is largely influenced by a mother's knowledge; the higher her understanding of breastfeeding, the more likely it is to affect her mindset and behavior. Given the persistent challenges surrounding maternal knowledge of exclusive breastfeeding, targeted educational interventions remain essential (Firmansyah et al., 2023).

To address insufficient maternal knowledge, education should include accurate information about exclusive breastfeeding, which can be delivered by health professionals (such as midwives, doctors, and nurses), lactation counselors, media, breastfeeding advocacy communities, and related organizations (Aprilia & Fitriah, 2017). One critical component of education is the media used; the use of appropriate and well-targeted educational tools increases the likelihood that information will be well-received, understood, and retained by mothers. Consequently, this can enhance maternal awareness and commitment to exclusive breastfeeding (Suryani et al., 2023).

In this study, mothers residing in the working area of Darussalam Public Health Center, Medan City, North Sumatra, were divided into two groups: one group received an educational intervention through a breastfeeding class, while the other did not. All mothers completed a pre-test and post-test to assess their knowledge levels regarding exclusive breastfeeding. The intervention aimed to increase maternal knowledge by providing nutrition-focused education on breastfeeding practices. The results of the study showed that there were significant differences in maternal knowledge scores between the intervention and control groups at the first week, third month, and sixth month post-intervention. Educational interventions were shown to be an effective method of delivering health and nutrition-related information, particularly for mothers of infants under six months of age.

Changes in maternal knowledge following the intervention indicated progression through different stages of learning. In the first week and first month, mothers had reached the "knowledge" level, where they could recall basic concepts such as the benefits of early initiation of breastfeeding (EIBF), the definition of exclusive breastfeeding, and the appropriate timing for introducing complementary feeding. By the third and sixth months, mothers had reached the "comprehension" level, where they could correctly explain and interpret information, such as how to perform EIBF, types of breast milk, and the age limits for exclusive breastfeeding.

Mothers with higher levels of knowledge are more likely to develop strong confidence in their ability to breastfeed exclusively. Educational interventions have been consistently shown to significantly increase maternal confidence in breastfeeding (Aprilia & Fitriah, 2017). The findings of this study support that the breastfeeding education class significantly improved maternal knowledge, as evidenced by the increase in knowledge scores before and after the intervention.

A broader range of information sources contributes to greater knowledge acquisition. Mothers exposed to varied sources of information whether from individuals or media tend to demonstrate better understanding and skills. Conversely, low knowledge levels may hinder the

development of new skills and limit the ability to access and apply new information (Astuti et al., 2020).

Working mothers may be unable to provide exclusive breastfeeding due to limited time to express milk, often opting for formula feeding instead. Maternal employment status is a significant factor affecting exclusive breastfeeding. Those with demanding work schedules may struggle to allocate sufficient time for breastfeeding or expressing milk (Lestari & Afridah, 2023). However, even non-working mothers may choose not to breastfeed exclusively, indicating that time availability alone does not guarantee breastfeeding success. Rather, a strong understanding and awareness of exclusive breastfeeding is essential for making informed decisions about infant feeding (Fajri et al., 2024).

## Conclusion

The findings of this study indicate a significant increase in knowledge scores among postpartum working mothers regarding exclusive breastfeeding in the group that received structured and personalized breastfeeding education (Personalized Breastfeeding Education/PBE), compared to the group that did not receive such education. The progressive improvement in knowledge from the first week to the sixth month suggests that PBE which includes individualized counseling, visual media, diary-based monitoring, and interactive discussions is effective in enhancing maternal understanding of exclusive breastfeeding. The combination of visual media, diary tools, and interactive counseling should be standardized as an effective educational strategy to improve maternal knowledge. These findings reinforce the importance of tailoring educational interventions to the working conditions of mothers in order to increase awareness and promote exclusive breastfeeding practices during the first six months of an infant's life. The researcher recommends that the Medan City Government and the Department of Manpower collaborate in formulating policies that support breastfeeding friendly work environments by providing adequate time, facilities, and workplace policies that enable mothers to breastfeed exclusively. The Medan City Health Office is encouraged to conduct training for midwives and other health professionals to deliver evidence-based and contextually appropriate breastfeeding education to ensure more impactful interventions. Additionally, the Darussalam Public Health Center in Medan is advised to integrate personalized breastfeeding education into routine maternal healthcare services, particularly for employed mothers.

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