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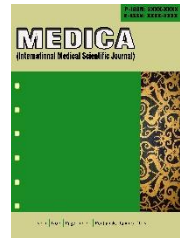

The Effect of Pocket Book on Kangaroo Care Method for Mothers Giving Birth to Babies Weighing <2500 Grams

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Abstract

Low Birth Weight (LBW) is defined as a birth weight of less than 2,500 grams regardless of gestational age, measured within one hour after birth. Globally, the prevalence of LBW reaches approximately 21% of all births. In Landak District, the incidence of LBW fluctuated from 4.5% in 2020 to 2.6% in 2021 and increased again to 5.0% in 2022. Kangaroo Care (KC) is an effective method for improving the survival and health outcomes of LBW infants; however, its implementation requires adequate maternal knowledge and skills. Educational media, such as pocket books, can facilitate learning by making information easier to understand and remember. This study aimed to determine the effect of pocket book-based education on mothers' knowledge and skills regarding Kangaroo Care among mothers who gave birth to LBW infants in Landak Regency. This study employed a pre-experimental design using a one-group pretest–posttest approach. A total of 22 respondents were selected using consecutive sampling. Data were analyzed using the Wilcoxon signed-rank test. The results showed a significant improvement in both knowledge and skills after the intervention, with p-values of <0.001. In conclusion, pocket book-based education is effective in improving mothers' knowledge and skills regarding Kangaroo Care among mothers with LBW infants in Landak Regional General Hospital.

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1. INTRODUCTION

A normal newborn is defined as a baby born at a gestational age of 37–42 weeks, with a birth weight of 2500–4000 grams, an Apgar score >7, and no congenital abnormalities. Infants with a birth weight of less than 2500 grams are categorized as Low Birth Weight Infants (LBWI), regardless of gestational age, with weight measured within one hour after birth (Heddy, Ananda, & Marfuah, 2023). LBW infants commonly experience physiological challenges, particularly in maintaining body temperature due to increased heat loss, minimal subcutaneous fat, and limited thermoregulation capacity. Consequently, LBW significantly increases the risk of mortality, morbidity, and long-term developmental problems in neonates, infants, and children (Agussafutri, & Pangesti 2023).

Globally, the prevalence of LBW is estimated at 21% of all births, with higher rates in developing countries, particularly in Asia (42.7%). Approximately 60–80% of infant mortality is associated with LBW, and infants weighing less than 2500 grams have a risk of death up to 20 times higher than those with normal birth weight. The World Health Organization reported that 2.4 million newborns died in 2020, accounting for 47% of under-five mortality (Heddy, Ananda, & Marfuah, 2023). In Indonesia, the prevalence of LBW was reported at 6.2%, while infant mortality remains a concern, with 24 deaths per 1,000 live births (Ruminem et al., 2023). At the regional level, LBW prevalence in Landak Regency fluctuated, increasing to 5.0% in 2022 and placing the region among the highest contributors to infant mortality in West Kalimantan (Dinas Kesehatan Provinsi Kalimantan Barat, 2023).

LBW infants are highly vulnerable to complications, particularly hypothermia, which can lead to acidosis, hypoglycemia, respiratory distress, and increased mortality risk. Long-term impacts may include neurological disorders, growth impairment, and chronic health conditions (Ruminem et al. 2023). Management of LBW infants includes maintaining body temperature, ensuring adequate nutrition, preventing infection, and continuous monitoring (Agussafutri & Pangesti, 2023; Ruminem et al., 2023). However, conventional management using incubators faces several challenges, including high costs, limited availability, increased risk of nosocomial infections, and reduced mother–infant bonding (Suyatni, 2023). These limitations highlight the need for alternative, cost-effective, and accessible interventions.

Kangaroo Mother Care (KMC) has been widely recognized as an effective alternative to incubator care. KMC involves direct skin-to-skin contact between mother and infant, providing warmth, facilitating breastfeeding, preventing infection, and strengthening emotional bonding (Kamila & Elisa 2020). The benefits of KMC include preventing hypothermia, improving nutritional status, reducing infection rates, shortening hospital stays, and lowering healthcare costs (Nurhayati et al., 2021). However, successful implementation of KMC depends heavily on maternal knowledge and skills. Education is therefore essential to improve parents' readiness in caring for LBW infants. Various educational media can be used, including pocket books, which present information in a simple, attractive, and easily understandable format, allowing repeated reading and better retention (Wulandari, 2022; Dewi, Prastyoningsih, & Hapsari, 2023). Previous research has shown that educational interventions significantly improve parental knowledge regarding KMC (Nurhayati et al., 2021).

Despite the effectiveness of KMC and educational interventions, there remains a gap between knowledge and practice in real settings. Data from Landak Regional General Hospital show a significant increase in LBW cases, reaching 52% of total neonatal cases in 2023, while the number of incubators is limited to only 10 units. Preliminary findings also revealed that most mothers were not familiar with KMC techniques, although they expressed a willingness to implement them. This indicates a gap in effective educational delivery methods for KMC. Therefore, this study offers novelty by utilizing pocket book media as an educational intervention to improve maternal knowledge and skills regarding KMC, which has not been widely explored in this specific context.

The objective of this study is to determine the effect of pocket book-based education on mothers' knowledge and skills regarding Kangaroo Mother Care (KMC) among mothers who give birth to LBW infants (<2500 grams) at Landak Regional General Hospital.

2. METHOD

This study employed a quantitative approach with a pre-experimental design using a one-group pretest–posttest design. This design was used to assess changes in mothers' knowledge and skills before and after the intervention in the form of pocket book-based education on Kangaroo Mother Care (KMC).

The population in this study consisted of all Low Birth Weight (LBW) infants (<2500 grams) treated in the Perinatology Unit of Landak Regional General Hospital in 2023, totaling 78 infants. Based on sample size calculation, a total of 22 respondents were selected as the study sample using a consecutive sampling technique, with mothers of LBW infants as the respondents.

Data collection was conducted using structured questionnaires to measure mothers' knowledge and observation checklists to assess mothers' skills in performing Kangaroo Mother Care. Prior to data collection, researchers obtained permission from the Landak District Health Office and Landak Regional General Hospital. Respondents were provided with informed consent before participation. The research instruments had been prepared in advance, including questionnaires, observation checklists, and educational media in the form of pocket books.

Data analysis was carried out using univariate and bivariate analysis. Univariate analysis was used to describe the distribution of respondents' characteristics, as well as the levels of knowledge and skills before and after the intervention, presented in frequencies, percentages, medians, and standard deviations. Prior to bivariate analysis, a normality test was conducted to determine the data distribution. Because the data were not normally distributed, bivariate analysis was performed using the Wilcoxon signed-rank test to assess the effect of pocket book-based education on mothers' knowledge and skills regarding Kangaroo Mother Care.

This study has received ethical approval from the Ethics Committee of the Pontianak Ministry of Health Polytechnic with ethical clearance number: 187/KEPK-PK.PKP/VI/2024.

3. RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Respondents by Age, Education, Occupation, Parity and Infant Birth Weight .

Category	**n**	**%**
Age		
<20 years or >35 years	6	27.3
20–35 years	16	72.7
Total	22	100
Education Level		
Basic (Elementary & Junior High School)	8	36.4
Secondary (Senior High School)	9	40.9
Higher (Diploma & Bachelor's Degree)	5	22.7
Total	22	100

Occupation		
Not working/Housewife	19	86.4
Civil Servant	2	9.1
Private Employee	1	4.5
Total	22	100
Parity		
1 or ≥4 children	10	45.5
2–3 children	12	54.5
Total	22	100
Birth Weight		
<2000 grams	9	40.9
2000–<2500 grams	13	59.1
Total	22	100

Table 1 indicates that the majority of respondents were aged 20–35 years (72.7%), reflecting that most participants were within the optimal reproductive age group. In terms of education, most respondents had a secondary level of education (40.9%), followed by those with basic education (36.4%), suggesting that the overall educational background of participants was moderate. Regarding occupation, almost all respondents were housewives (86.4%), which may imply greater availability of time for infant care and participation in health-related activities.

Furthermore, more than half of the respondents had 2–3 children (54.5%), indicating that most mothers had prior experience in childcare. In terms of infant characteristics, the majority of babies had a birth weight of 2000–<2500 grams (59.1%), classifying them as moderate low birth weight (LBW) infants.

Table 2. Distribution of Knowledge and Skills Before and After Intervention.

Variable	**Measurement**	**Median**	**Min**	**Max**
Knowledge	Pre-test	13	9	14
	Post-test	16	16	19
Skills	Pre-test	5	3	7
	Post-test	8	6	9

Table 2 shows that there was an increase in both knowledge and skills after the intervention. The median knowledge score increased from 13 to 16, while the median skills score increased from 5 to 8, indicating improvement following pocket book education.

Table 3. Effect of Pocket Book Education on Knowledge and Skills.

Variable	**Measurement**	**n**	**Median**	**Min–Max**	**p-value***
Knowledge	Pre-test	22	13	9–14	0.000
	Post-test	22	16	14–19	
Skills	Pre-test	22	5	3–7	0.000
	Post-test	22	8	6–9	

**Wilcoxon Signed-Rank Test*

Table 3 shows that the results of the Wilcoxon test showed a significant increase in both knowledge and skills after the intervention ($p < 0.05$). The median knowledge score increased from 13 to 16, while the median skills score increased from 5 to 8. These findings indicate that pocket book-based education has a significant effect on improving mothers' knowledge and skills regarding Kangaroo Mother Care (KMC) among mothers with LBW infants at Landak Regional General Hospital.

The results of this study indicate that education using pocket book media has a significant effect on improving mothers' knowledge regarding the Kangaroo Care Method (KCM) for infants with birth weight <2500 grams at Landak Regional General Hospital. This increase in knowledge is consistent with the theory that actions based on knowledge tend to be more sustainable than those performed without adequate understanding (Notoatmodjo, 2018). Knowledge is obtained through sensory processes, particularly sight and hearing, making educational media such as pocket books effective tools for enhancing comprehension (Octaviana & Ramadhani, 2021). Furthermore, behavioral change through health education involves the delivery of information, persuasion, and awareness-building, which, although gradual, can lead to long-lasting behavioral improvements (Susilawati, 2022).

These findings are supported by previous studies demonstrating that educational media, including booklets and pocket books, effectively improve knowledge. Research by Rosalia, Widyastutik, & Astutik (2023) showed a significant effect of booklet media on breastfeeding technique knowledge (p=0.00), while Wulansari, Winarni, and Lala (2021) found that pocket books significantly improved adolescent reproductive health knowledge (p=0.000). Similarly, studies by Nurhayati et al. (2021) confirmed that education on kangaroo care increases parental knowledge of low birth weight (LBW) infant care. However, contrasting findings were reported by Yuliana (2024), where most mothers still had only moderate knowledge of KCM. This suggests that knowledge levels are influenced by various factors such as education, experience, and access to information (Widayati, 2018).

Respondent characteristics in this study also contributed to the improvement in knowledge, as most participants were within the productive age range (20–35 years), had secondary education, and had prior childbirth experience (parity 2–3). These factors are known to influence an individual's ability to receive and process information. Pocket books as an educational medium offer several advantages, including portability, ease of repeated reading, and the combination of text and visual elements, which facilitate better understanding (Putri, 2021; Wulandari, 2022). Consequently, this medium enhances learning interest and strengthens information retention among mothers.

In addition to improving knowledge, the study also found that pocket book media significantly improved mothers' skills in performing KCM, as evidenced by increased post-intervention skill scores and statistically significant results ($p < 0.05$). Skills represent the practical application of knowledge; therefore, improvements in knowledge are directly associated with improved skills (Rambe & Sinaga, 2021). Educational interventions enable mothers not only to understand the concept of KCM but also to apply it effectively in caring for LBW infants. These findings are consistent with studies by Mardiah et al. (2019) and Krissanti & Wardani (2022), which demonstrated that health education effectively enhances maternal skills in infant care.

The improvement in skills is also influenced by maternal experience (parity), educational level, and readiness to receive information. Mothers with prior childbirth experience tend to adapt more easily to new caregiving practices. Additionally, the attractive and user-friendly design of pocket books facilitates recall and practical implementation of KCM procedures (Setiyaningsih 2024). KCM itself is a simple, effective, and economical method of caring for LBW infants, providing thermal regulation through skin-to-skin contact, strengthening mother–infant bonding, and supporting breastfeeding (Kamila & Elisa, 2020; Noviana & Kartini, 2023). Therefore, improving maternal skills in KCM is essential for optimizing the growth and development of LBW infants.

In conclusion, this study demonstrates that pocket book media is effective in improving both knowledge and skills of mothers in implementing the Kangaroo Care Method (KCM) for low birth weight infants. These improvements are supported by respondent characteristics, the effectiveness of educational media, and the learning process that integrates understanding with practice. Therefore, pocket books can serve as an alternative medium for maternal and child health education, particularly in the care of LBW infants.

However, this study has several limitations. The use of a pre-experimental design without a control group limits the ability to fully control for external variables that may influence the results. The relatively small sample size also restricts the generalizability of the findings. Additionally, skill assessment was conducted shortly after the intervention, which does not reflect long-term retention or sustainability of skills. Future studies are recommended to use a true experimental design with control groups and larger sample sizes to obtain more robust and generalizable findings.

4. CONCLUSION

In conclusion, the use of pocket books has a significant effect on improving mothers' knowledge and skills in applying kangaroo care (KC) for infants with low birth weight at Landak Regional General Hospital.

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