



## THE EFFECT OF KANGAROO MOTHER CARE ON REDUCING POSTPARTUM DEPRESSION: A SYSTEMATIC REVIEW

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### Abstract

**Background:** Postpartum depression is a frequent health problem for women during the postpartum period and contribute to maternal morbidity and mortality. Postpartum depression continues to rise with the estimated prevalence in Indonesia is 11.76% in 2021. Kangaroo Mother Care is care for premature babies with skin-to-skin contact between the mother and the baby. Kangaroo Mother Care has been utilized as a non-pharmacological intervention to prevent and reduce the risk of postpartum depression. The aim of the research is to assess the possibility of using Kangaroo Mother Care to reduce the risk of postpartum depression. **Method:** This was a systematic review study reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement. Literature was searched in PubMed, Science Direct, Scopus, Sage, and Scilit databases with criteria; article published in 2014–2023, published in English and open access, original research articles, includes postpartum mothers as subjects, includes discussion on the impact of Kangaroo Mother Care on postpartum depression. Exclusion criteria are duplicate articles and articles with titles that do not match the discussion. **Result:** Six articles that met the inclusion criteria were used in this study. Research and studies were conducted in Indonesia, Spain, and 2 studies in Iran and India. Five studies found that postpartum mothers who carried out Kangaroo Mother Care showed reduction in the risk of postpartum depression, while one study showed the opposite results. **Conclusion:** Kangaroo Mother Care is effective in reducing postpartum depression in postpartum mothers.

Keyword: Kangaroo Mother Care, Postpartum Depression, Postpartum Mothers

### INTRODUCTION

The experience of becoming pregnant and giving birth are two significant moments in a woman's life. The sudden and significant new roles and responsibilities the woman bears and the physiological changes after giving birth may be too big to bear that it may increases the chance of mothers developing postpartum depression during the postpartum period (Cristescu et al., 2015). After giving birth, the mother will experience changes in both psychological and physical aspects. That are often seen as favourable for women. However, these changes



require difficult physical, psychological, and social adaptations (Habel et al., 2015). In consequence, psychological disorders such as baby blues can occur if not handled quickly and appropriately, psychological disorders can progress to become postpartum depression (Putriarsih et al., 2018). Postpartum depression is a mental health issue in the postpartum period and affect women after giving birth to a child. According to Centerd for Disease Control and Prevention (2023), depression is a common mental health illness and serious illness in the United States, and the research found postpartum depression is experienced by 1 in 8 women with a recent live birth. Depression experienced after childbirth or postpartum depression contributes to maternal morbidity and mortality (Myo et al., 2021).

Postpartum depression is a mood disorder that reflects psychological dysregulation, which is a sign of major depressive symptoms (Kusuma, 2017). After the birth process, postpartum depression usually appears in the second week to six months after birth (Ardiani et al., 2020). Postpartum depression's common signs are anxiety, irritability, desperation, sadness, nausea, mental lability feelings of isolation, nausea, alterations in sleep and eating patterns, diminished sexual desire, crying spells, thoughts of self-harm or harm towards the baby, and even thoughts of suicide (Robertson et al., 2004). Age, hormones, economic status, husband's support, family support, education, employment status, maternity status, and the type of childbirth performed are risk factors of postpartum depression (Arimurti et al., 2020).

The prevalence of postpartum depression continues to rise. A literature study conducted by (Halbreich and Karkun, 2006) in 2005 showed that the prevalence of postpartum depression among countries ranged from 0.5% - 60.8%. Then another study by Wang et al., (2021) found that the prevalence in countries in the world ranged from 6.48% - 60.93%. Based on these two studies, it can be seen that the prevalence of postpartum depression has increased. Then, based on the study by Wang et al., (2021), it can be seen that the prevalence of postpartum depression in South-eastern Asia is 13.53% and ranks third highest on the Asian Continent after Southern Asia in first place and Western Asia in second place. Then, the prevalence of postpartum depression in Indonesia is 11.76% and is in seventh place out of seven countries on the Southeast Asia continent studied. Even so,



postpartum depression should not be underestimated, and prevention efforts must still be made.

Kangaroo Mother Care is care for premature babies with skin to skin contact between the mother and the baby. The Kangaroo Mother Care Method is a method used to improve the health and well-being of premature and full-term babies that is effective and easy to use (WHO, 2003). Not only for babies, Kangaroo Mother Care is also beneficial for the mother's health. A study suggests preventing and reducing the risk of postpartum depression, can be done by using Kangaroo Mother Care as a non-pharmacological intervention (Badr and Zauszniewski, 2017). Although the risk factors for postpartum depression are considered multi-factorial, some literature identifies the important role of Kangaroo Mother Care in postpartum depression. Several scholarly investigations have studied the connection between Kangaroo Mother Care and postpartum depression. Carrying out a systematic review is important to assess the impact of Kangaroo Mother Care on reducing postpartum depression. The last Systematic Review study discussing the effects of Kangaroo Mother Care on postpartum depression was carried out in 2021 by Kirca, N., and Adibelli, D. (2021). This review, however was limited to randomized controlled studies and quasi-experimental study designs. Including more recent studies with wider range of study design related to the topic of Kangaroo Mother Care and postpartum depression need to be carried out. Thus, this review can explore more on the possibility of using Kangaroo Mother Care to reduce the risk of postpartum depression.

## METHOD

The method of systematic review was used in the current study. This study was carried out in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) declaration, which outlines the preferred reporting items for systematic reviews and meta-analyses.

### Search Strategy

We searched for all studies published between 1 January 2014 to 23 June 2023, using the following databases: Science Direct, Scopus, Sage, Pubmed, and Scilit. The keywords for finding literature search are as follows: ("Kangaroo

Mother Care” OR “Skin to Skin Contact” OR “Kangaroo Method” OR “Kangaroo Care”) AND “Postpartum Depression” OR “Postnatal Depression”).

### **Inclusion Criteria**

The criteria for inclusion in this study were open access article, published in English between 2014 to 2023, original research articles that included postpartum mothers as subject, and research articles that included discussion on the impact of Kangaroo Mother Care on postpartum depression.

### **Exclusion Criteria**

The exclusion criteria were as follows: duplicate articles, articles whose titles did not correspond to the subject matter that was going to be research, research designs consisting of a systematic review, literature review, case report, and editorial article, and unavailability of access to full text.

## **RESULT AND DISCUSSION**

The search strategy resulted in 2.494 articles, consisting of 46 articles from Pubmed, 377 articles from ScienceDirect, 74 articles from Scopus, 82 articles from Sage Journal, and 1.914 articles from Scilit. The articles obtained are then filtered using the filter feature in each journal based on the year of publication and then based on open access. Based on the year of publication, 613 articles were excluded because the year of article publication was not 2014–2023. Then the articles were analysed based on open access criteria, and there were 1103 articles excluded. Furthermore, a total of 777 articles that were identified as appropriate based on year of publication and open access were entered into the Zotero application to check journal duplication, and the results were that 47 journals were excluded. Then the articles were analysed based on the article title, and the results obtained were 33 suitable articles, and 697 articles were excluded because the title of the articles did not match the concept of this study. Furthermore, a total of 33 articles were identified based on the abstract, and 26 articles were excluded because the abstract did not match the criteria of this study. Then, the identification results based on abstracts obtained seven articles and were analysed again based on language. A total of one article was excluded because it was not written in English. After all exclusions, six studies were found to match the search criteria and included in the



analysis (Figure 1). Of the six studies, one study was conducted in Indonesia, one in Spain, two studies in Iran and another two in India.

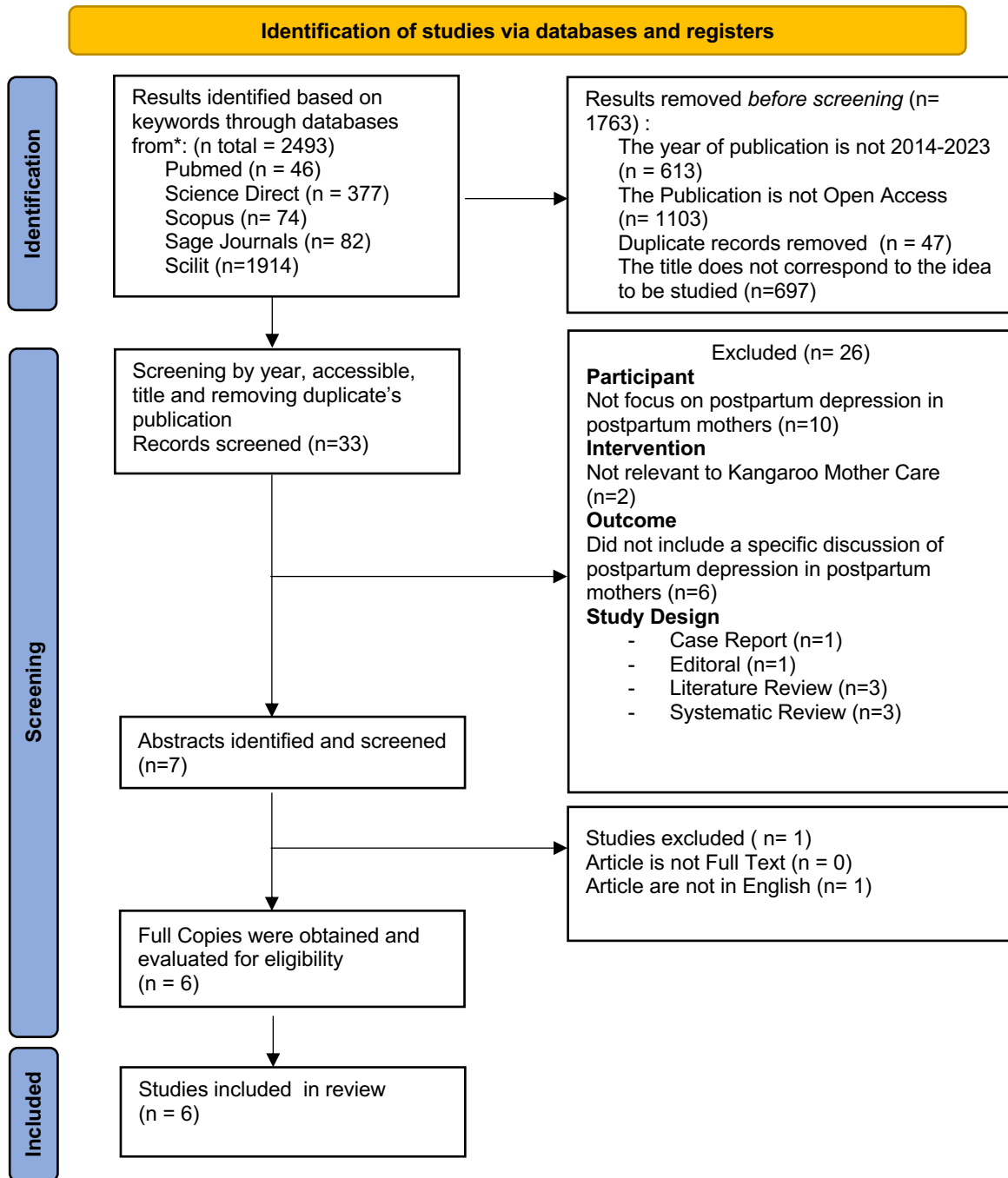
Based on the six studies, two studies by Herizchi et al., (2017) and Cañadas et al., (2022) were conducted on mothers of preterm babies. Two studies by Badiee et al., (2014) and Rao et al., (2019) conducted studies on mothers of preterm babies with low birth weight. One study by Sinha et al., (2021) conducted studies on mothers of low birth weight babies and another study by Andriani et al., (2019) conducted studies on mothers of normal weight babies. As many as three studies used Edinburgh Postnatal Depression Scale, and other studies used The 28-item General Health Questionnaire, Patient Health Questionnaire-9, or Hospital Anxiety and Depression Scale (HADS) (Table 1).

The number of respondents in the included study amounted to 2.302 respondents. The six articles were located and subsequently analyzed for quality and assessed for the impact on postpartum depression.

#### **Quality of the Included Studies**

Based on the six studies, only two studies selected participants randomly ie: Badiee, et al., (2014) and Sinha et al., (2021). Two studies used convenience or availability sampling technique (Herizchi et al., 2017; Rao et al., 2019) and two studies, did not clearly explain how they selected the participants (Andriani et al., 2019; Cañadas et al., 2022). One of the study had unfair comparisons as they did not have true control (Rao et al., 2019).

Figure 1. PRISMA Flowchart



**Table 1. Summary Results of Literature Search for The Systematic Review**

No	Article Title	Author (Year) Country	Method (Design, Sample, Variable, Instrument, Analysis)	PI/ECO (Problem, Intervention/Exposure, Comparison, Outcome)	Important Findings
1.	The effect of kangaroo mother care on mental health of mothers with low birth weight infants	Badiee <i>et al</i> (2014) Iran	<b>D</b> : Randomized Control Trial <b>S</b> : 50 Postpartum Mother-Infants pairs <b>V</b> : Kangaroo Mother Care, Postpartum Depression, Anxiety symptoms and sleep, social health, Physical disorders <b>I</b> : The 28-item General Health Questionnaire <b>A</b> : Analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA)	<b>P</b> : Postpartum Mother-Infants pairs <b>I</b> : KMC for 60 minutes each day for one week <b>C</b> : - <b>O</b> : Effect of KMC on maternal and infant health	The mean score of the 28-item General Health Questionnaire in the experimental group after the Kangaroo Mother Care intervention was significantly difference (P <0.001). The mean score decrease after intervention. The mean score of the pretest was 5.86 (±4.77) and the mean score of the posttest was 4.96 (±4.24).
2.	Effect of Community-Initiated Kangaroo Mother Care on Postpartum Depressive Symptoms and Stress Among Mothers of Low-Birth-Weight Infants: A Randomized Clinical Trial.	Sinha <i>et al</i> (2021) India	<b>D</b> : Randomized Control Trial <b>S</b> : 1950 Postpartum Mothers <b>V</b> : Kangaroo Mother Care, Postpartum Depressive Symptoms <b>I</b> : Patient Health Questionnaire–9 <b>A</b> : Multinomial Logistic Regression	<b>P</b> : Postpartum Mothers <b>I</b> : KMC for 28 days <b>C</b> : - <b>O</b> : KMC reduces the risk of postpartum depressive symptoms.	In contrast to mothers who do not engage in Kangaroo Mother Care, postpartum mothers who engage in Kangaroo Mother Care are 25% less likely to experience moderate to severe postpartum depression symptoms.
3.	Effect Of Kangaroo Mother Care (KMC) On EPDS Score On Post Partum In Midwife	Andriani <i>et al</i> (2019) Indonesia	<b>D</b> : Quasi Experimental <b>S</b> : 30 Postpartum Mothers <b>V</b> : Kangaroo Mother Care, Postpartum Depression	<b>P</b> : Postpartum Mothers <b>I</b> : Kangaroo Mother Care	After implementing Kangaroo Mother Care, there was an increase of the mean EPDS score in the group given the intervention. The mean score before Kangaroo Mother

	Independent Practice Bengkulu Indonesia		<b>I</b> : Edinburgh Postnatal Depression Scale (EPDS) <b>A</b> : T-test Statistic	<b>C</b> : - <b>O</b> : Effect of KMC on EPDS score	Care was 14.67 ( $\pm 6.25$ ) and after Kangaroo Mother Care was 22.87 ( $\pm 3.98$ ).
4.	The impact of Kangaroo-Mother care on postpartum depression in mothers of premature infants	Herizchi <i>et al</i> (2017) Iran	<b>D</b> : Prospective Cohort <b>S</b> : 60 Postpartum Mothers <b>V</b> : Kangaroo Mother Care, Postpartum Depression <b>I</b> : Edinburgh Postnatal Depression Scale (EPDS) <b>A</b> : Independent T-test test	<b>P</b> : Postpartum Mother-Infants pairs <b>E</b> : KMC is carried out 3 times or more/day. <b>C</b> : - <b>O</b> : KMC decreased depression in mothers	The mean score of the Edinburgh Postnatal Depression Scale on day 20 and day 30 after birth in mothers who had Kangaroo Mother Care 3 times per day was significantly decrease with a mean score of 9.16 ( $\pm 2.87$ ) and 8.10 ( $\pm 2.72$ ) respectively ( $P < 0.001$ ), compared to the 10th day, which was 13.30 ( $\pm 4.38$ )
5.	Benefits of Kangaroo Mother Care on the Physiological Stress Parameters of Preterm Infants and Mothers in Neonatal Intensive Care.	Cañadas <i>et al</i> (2022) Spain	<b>D</b> : Cohort Study <b>S</b> : 112 Postpartum Mother-Infants pairs <b>V</b> : Kangaroo Mother Care, Postpartum Depression <b>I</b> : Edinburgh Postnatal Depression Scale (EPDS) <b>A</b> : Chi Square, Pearson's Correlation	<b>P</b> : Postpartum Mother-Infants pairs <b>E</b> : KMC for 90 minutes per day during the first 2 weeks <b>C</b> : - <b>O</b> : KMC plays a role in reducing postpartum depression	<ul style="list-style-type: none"> <li>- The mean score of the Edinburgh Postnatal Depression Scale after implementing Kangaroo Mother Care on the 15<sup>th</sup> day significantly decreased. The mean score on day 15 was 15.39 (<math>\pm 2.4</math>) while on day 3, the mean score was 17.28 (<math>\pm 2.7</math>).</li> <li>- There was a decrease in cortisol levels in postpartum mothers on the 15th day after the implementation of Kangaroo Mother Care (<math>p=0.002</math>)</li> </ul>
6.	Does Kangaroo Mother Care Reduce Anxiety in Postnatal Mothers of Preterm Babies? - A Descriptive Study from a Tertiary Care Centre in South India	Rao <i>et al</i> (2019) India	<b>D</b> : Cross Sectional <b>S</b> : 100 Postpartum Mothers <b>V</b> : Kangaroo Mother Care, Postpartum Depression <b>I</b> : Hospital Anxiety and Depression Scale (HADS) <b>A</b> : Chi Square	<b>P</b> : Postpartum Mother <b>E</b> : KMC <b>C</b> : - <b>O</b> : KMC plays a role in reducing stress	After the Kangaroo Mother Care was carried out, The total and mean scores of the Hospital Anxiety and Depression Scale were significantly lower. The mean score of the pre Kangaroo Mother Care group was 9.15 ( $\pm 4.3$ ) and the mean score of the post Kangaroo Mother Care group was 7.24 ( $\pm 5.15$ )





### **The Effect of Kangaroo Mother Care on Reducing Postpartum Depression**

According to the findings of a review of six articles discussing kangaroo mother care and postpartum depression, five studies found that the application of the Kangaroo Mother Care method is associated with a reduction in postpartum depression risk or severity. Meanwhile, there is one study that found that implementing the Kangaroo Mother Care method could increase postpartum depression scores.

Research conducted by Herizchi et al., (2017) and Cañadas et al., (2022) conducted the Kangaroo Mother Care study on postpartum mothers of premature babies. The results of these two studies found that there was a decrease in the mean Edinburgh Postnatal Depression Scale score after implementing the Kangaroo Mother Care intervention. Study conducted by Herizchi et al., (2017) conducted interventions in the Kangaroo Mother Care intervention group, three or more times per day for 30 days. This study states that postpartum mothers who have experienced Kangaroo Mother Care have less common postpartum depression. Postpartum mothers who carried out Kangaroo Mother Care three or more times per day may see a decrease in postpartum depression compared to postpartum mothers who did not use the Kangaroo Mother Care method. Based on this study, the Edinburgh Postpartum Depression Scale (EPDS) score decreased on the 20th day ( $P < 0.001$ ) and 30th day ( $P < 0.001$ ) in mothers who received Kangaroo Mother Care three times per day after birth, with a mean of  $9.16 (\pm 2.78)$  and  $8.10 (\pm 2.72)$ . Poor birth conditions can cause problems and depression in the mother. In another study by Cañadas et al., (2022), the implementation of the Kangaroo Mother Care method is carried out for 90 minutes per day, started on the third day after birth and lasting until 12 days. Then it was found that there was a significant decrease in the mean score of the Edinburgh Postnatal Depression Scale (EPDS) after implementing Kangaroo Mother Care on day 15, which was  $15.39 (\pm 2.4)$  compared to day 3, where the mean score was  $17.28 (\pm 2.7)$ . Based on research of these two studies, it can be seen that Kangaroo Mother Care has the effect of reducing postpartum depression in postpartum mothers who have premature babies.

Two studies by Badiee et al., (2014) and Rao et al., (2019) conducted studies on postpartum mothers of preterm babies with low birth weight. The results of

research conducted by Badiie et al., (2014) found a positive effect of Kangaroo Mother Care on postpartum mothers on maternal mental health scores (including sleep disorders and anxiety, maternal depression, and level of social interaction). The research used the 28-item General Health Questionnaire instrument to assess postpartum depression, and the study found that there was a significant decrease in the mean score in mothers who did Kangaroo Mother Care, where the mean score of the pretest was 5.86 ( $\pm 4.77$ ) and the mean score of the posttest was 4.96 ( $\pm 4.24$ ) with the  $p$  value  $< 0.001$ . Which means Kangaroo Mother Care affects maternal mental health, including depression. The results of this study are also in line with research from Rao et al., (2019). Using the Hospital Anxiety and Depression Scale (HADS) as an instrument, the results of the study showed that the mean depression score and total score were significantly lower in the group after implementing Kangaroo Mother Care compared to the group that had not implemented Kangaroo Mother Care. Before Kangaroo Mother Care intervention, the mean depression subscale was 9.15 ( $\pm 4.3$ ) and after intervention, the mean depression subscale was 7.24 ( $\pm 5.15$ ) with the  $p$ -value 0.05. Apart from the postpartum period, maternal depression can also have long-term impacts on premature newborns. Kangaroo Mother Care should be encouraged for all mothers of premature babies, especially in countries with limited resources (Rao et al., 2019). Compared to other methods of caring for premature babies, the Kangaroo Mother Care method has a great impact on the mother's mental health (Badiie et al., 2014). Based on the results of research by Rao et al., (2019) and Badiie et al., (2014), it can be seen that postpartum depression in mothers with premature babies and low birth weight can be reduced by doing Kangaroo mother care.

The effect of Kangaroo Mother Care on reducing postpartum depression does not only occur in postpartum mothers with premature babies or premature babies with low birth weight. The research of Sinha et al., (2021) conducted on postpartum mothers with low birth weight babies, using the Patient Health Questionnaire-9 as an instrument, also shows the effect of Kangaroo Mother Care on reducing postpartum depression. Following the implementation of the Kangaroo Mother Care intervention during the 28 days after birth, the results showed that postpartum mothers who implemented the Kangaroo Mother Care method had a



lower risk of 25% experiencing moderate to severe postpartum depression symptoms.

Different research results regarding the effect of Kangaroo Mother Care on Postpartum Depression were found in the results of research by Andriani et al., (2019). Postpartum mothers with normal babies were respondents in the research. By using the Edinburgh Postnatal Depression Scale an instrument to assess postpartum depression in mothers, it was found that Kangaroo Mother Care could increase the mean score of the Edinburgh Postnatal Depression Scale. This can be seen from the results of the Kangaroo Mother Care intervention carried out 10 days after birth. On the first day, the mean score was 14.67 ( $\pm 6.25$ ), and on the 10th day, the mean score was found to be 22.87 ( $\pm 3.98$ ) (p value 0.001). The average score of the Edinburgh Postnatal Depression Scale increased after implementing the Kangaroo Mother Care intervention for ten days after birth, indicating that Kangaroo Mother Care was not effective in reducing postpartum depression in this study. So the research results from this article have different results from the research results of other articles in this article, which state that Kangaroo Mother Care plays a role in reducing postpartum depression.

Based on six research studies, it can be seen that the majority of studies state that there is an effect of implementing Kangaroo Mother Care on reducing postpartum depression, in postpartum mothers who have premature babies, postpartum mothers who have premature babies with low birth weight, and postpartum mothers of low birth weight. Although there is one study on postpartum mothers of normal babies that found Kangaroo Mother Care to increase postpartum depression, it cannot be denied that Kangaroo Mother Care has a role in reducing postpartum depression. This can be known because, the Kangaroo Mother Care method can improve the main emotional, physical, and intellectual relationships between mother and child. In addition, the Kangaroo Mother Care method reduces maternal anxiety and stress and reduces severe depression in mothers (Badiie et al., 2014) Therefore, Kangaroo Mother Care is a method that needs to be used by postpartum mothers to reduce the risk or severity of postpartum depression. The greater level of intimacy and direct contact between mothers and their infants when

applying Kangaroo Mother Care can mitigate the negative effects of maternal stress (Cañadas et al., 2022).

### **The Role of Cortisol and Oxytocin as a Factor Affecting Postpartum Depression**

Cañadas et al., (2022) who conducted research on 112 preterm infants and their mothers asserted that implementing the Kangaroo Mother Care method for an average of more than 90 minutes per day for the first two weeks can significantly reduce maternal cortisol levels and the postpartum depression scale. This is evidenced by the significantly lower mean cortisol levels in the Kangaroo Mother Care group ( $p=0.002$ ) after intervention days. Cortisol is a hormone produced when the hypothalamic-pituitary-adrenocortical axis is activated in response to physiological stress (Sinha et al., 2021). The hormone cortisol is associated with the body's response to stress. The hormone cortisol is released by the adrenal glands when someone is facing stress or is called an indicator of stress. Reducing the hormone cortisol has an effect on reducing postpartum depression (Fithriany et al., 2022).

Kangaroo Mother Care could reduce postpartum depression possibly via lowering of cortisol secretion and via the release maternal oxytocin. Several neurohormonal mechanisms, including oxytocin release, may contribute to the reduction of maternal anxiety during Kangaroo Mother Care (Cong et al., 2015). During Kangaroo Mother Care, oxytocin is released into the bloodstream that upon reaching the amygdala, works to turn off the stress systems and increase positive feelings (Badr and Zauszniewski, 2017; Harvard, 2023). Oxytocin can assist in reducing the circulation of maternal Catecholamines, a hormone produced by the stress system in response to stimulants that are demanding, harmful, or threatening (Badr and Zauszniewski, 2017).

### **Comparison with Similar Studies That Have Been Conducted**



This research found that skin to skin contact (Kangaroo Mother Care) is a method that has many benefits and is effective for reducing postpartum depression. The findings of this study are consistent with the findings of a systematic review conducted by Kirca and Adibelli, (2021). However, compared to the systematic review research that we conducted, research conducted by Kirca and Adibelli, (2021) only found 3 articles that met their inclusion criteria using more limiting keywords. We also found a study that explains the possible role Kangaroo Mother Care on reducing cortisol and increasing oxytocin, and provides information on the benefits of decreasing and increasing oxytocin against stress.

### **Limitations of the Study**

The findings in this systematic literature review study have limitations. First, the search for sources of literature in this study is limited to studies in English. Thus, there is a possibility of missing some relevant studies that may employ languages besides English. Second, the weakness is that the available literatures on the topic are limited to four countries. The study included in this literature review were conducted in Indonesia, India, Iran, and Spain, in which cover only two continents, namely the Asian Continent and the European Continent. Another limitation of this study is that there is heterogeneity in this study, where there is no uniformity of questionnaire used among the included studies, such as Edinburgh Postnatal Depression Scale (EPDS), the 28-item General Health Questionnaire, Patient Health Questionnaire-9, and Hospital Anxiety and Depression Scale (HADS), and Most importantly, only two studies employed randomized controlled trial, thus the evidence for causal effect is limited.

### **CONCLUSION AND SUGGESTION**

Based on research results, most studies found that Kangaroo Mother Care played a role in reducing postpartum depression among postpartum mothers of preterm babies, preterm babies with low birth weight, and low birth weight babies. Although one research study found an increase in postpartum depression in mothers of normal babies after implementing Kangaroo Mother Care, it cannot be denied that Kangaroo Mother Care plays a role in reducing postpartum depression. There is not enough evidence to recommend adopting Kangaroo Mother Care into the

postnatal care service for all mothers, not only for preterm birth. More high quality randomized controlled trials studied are needed to draw a conclusion about the causal effect of Kangaroo Mother Care on postpartum depression and the mechanism.

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### REFERENCE

- Ardiani, A., Soemanto, R., Murti, B., 2020. Meta-Analysis: The Association between Social Support and Postpartum Depression. *Journal of Maternal and Child Health* 5, 641–650.
- Arimurti, I.S., Pratiwi, R.D., Ramadhina, A.R., 2020. STUDI LITERATUR FAKTOR-FAKTOR YANG MEMPENGARUHI KEJADIAN DEPRESI POST PARTUM. *Edu Dharma Journal: Jurnal penelitian dan pengabdian masyarakat* 4, 29–37. <https://doi.org/10.52031/edj.v4i2.53>
- Badr, H.A., Zauszniewski, J.A., 2017. Kangaroo care and postpartum depression: The role of oxytocin. *Int J Nurs Sci* 4, 179–183. <https://doi.org/10.1016/j.ijnss.2017.01.001>
- Cong, X., Ludington-Hoe, S.M., Hussain, N., Cusson, R.M., Walsh, S., Vazquez, V., Briere, C.-E., Vittner, D., 2015. Parental oxytocin responses during skin-to-skin contact in pre-term infants. *Early Human Development* 91, 401–406. <https://doi.org/10.1016/j.earlhumdev.2015.04.012>
- Cristescu, T., Behrman, S., Jones, S.V., Chouliaras, L., Ebmeier, K.P., 2015. Be vigilant for perinatal mental health problems. *Practitioner* 259, 19–23, 2–3.
- Cristóbal Cañadas, D., Parrón Carreño, T., Sánchez Borja, C., Bonillo Perales, A., 2022. Benefits of Kangaroo Mother Care on the Physiological Stress Parameters of Preterm Infants and Mothers in Neonatal Intensive Care. *Int J Environ Res Public Health* 19. <https://doi.org/10.3390/ijerph19127183>
- Fithriany, F., Yuniwati, C., Dewi, S., Harahap, L.K.S., 2022. Pengaruh Psikoedukasi Terhadap Kadar Hormon Kortisol Pada Ibu Tujuan Dengan Depresi Postartum Di Wilayah Kerja Dinas Kesehatan Kota Langsa Tahun 2020. *Jurnal Health Sains* 3, 1604–1611. <https://doi.org/10.46799/jhs.v3i11.681>
- Habel, C., Feeley, N., Hayton, B., Bell, L., Zerkowitz, P., 2015. Causes of women's postpartum depression symptoms: Men's and women's perceptions. *Midwifery* 31, 728–734. <https://doi.org/10.1016/j.midw.2015.03.007>
- Halbreich, U., Karkun, S., 2006. Cross-cultural and social diversity of prevalence of postpartum depression and depressive symptoms. *J Affect Disord* 91, 97–111. <https://doi.org/10.1016/j.jad.2005.12.051>



- Herizchi, S., Hosseini, M.B., Ghoreishizadeh, M., 2017. The impact of Kangaroo-Mother care on postpartum depression in mothers of premature infants. *Int. J. Women's Health Reproduction Sci.* 5, 312–317. <https://doi.org/10.15296/ijwhr.2017.53>
- Kirca, N., Adibelli, D., 2021. Effects of mother–infant skin-to-skin contact on postpartum depression: A systematic review. *Perspect. Psychiatr. Care* 57, 2014–2023. <https://doi.org/10.1111/ppc.12727>
- Kusuma, P.D., 2017. KARAKTERISTIK PENYEBAB TERJADINYA DEPRESI POSTPARTUM PADA PRIMIPARA DAN MULTIPARA. *Jurnal Keperawatan Notokusumo* 5, 36–45.
- Lusi Andriani, D.W., Rachmawati, 2019. Effect Of Kangaroo Mother Care (KMC) On EPDS Score On Post Partum In Midwife Independent Practice Bengkulu Indonesia.
- Myo, T., Hong, S.A., Thepthien, B.-O., Hongkralert, N., 2021. Prevalence and Factors Associated with Postpartum Depression in Primary Healthcare Centres in Yangon, Myanmar. *Malays J Med Sci* 28, 71–86. <https://doi.org/10.21315/mjms2021.28.4.8>
- Priyanka Rao, P.C., Raajashri R, Adhisivam Bethou, Vishnu Bhat, 2019. Does Kangaroo Mother Care Reduce Anxiety in Postnatal Mothers of Preterm Babies? – A Descriptive Study from a Tertiary Care Centre in South India. *Journal of Nepal Health Research Council* 17, 42–45. <https://doi.org/10.33314/jnhrc.v17i01.1228>
- Putriarsih, R., Budihastuti, U.R., Murti, B., 2018. Prevalence and Determinants of Postpartum Depression in Sukoharjo District, Central Java. *Journal of Maternal and Child Health* 3, 11–24.
- Robertson, E., Grace, S., Wallington, T., Stewart, D.E., 2004. Antenatal risk factors for postpartum depression: a synthesis of recent literature. *General Hospital Psychiatry* 26, 289–295. <https://doi.org/10.1016/j.genhosppsy.2004.02.006>
- Sinha, B., Sommerfelt, H., Ashorn, P., Mazumder, S., Taneja, S., More, D., Bahl, R., Bhandari, N., 2021. Effect of Community-Initiated Kangaroo Mother Care on Postpartum Depressive Symptoms and Stress Among Mothers of Low-Birth-Weight Infants: A Randomized Clinical Trial. *JAMA Network Open* 4, e216040. <https://doi.org/10.1001/jamanetworkopen.2021.6040>
- Wang, Z., Liu, J., Shuai, H., Cai, Z., Fu, X., Liu, Y., Xiao, X., Zhang, W., Krabbendam, E., Liu, S., Liu, Z., Li, Z., Yang, B.X., 2021. Correction: Mapping global prevalence of depression among postpartum women. *Transl Psychiatry* 11, 640. <https://doi.org/10.1038/s41398-021-01692-1>
- Zohreh Badiie, T.M., Salar Faramarzi, 2014. The effect of kangaroo mother care on mental health of mothers with low birth weight infants. *Ibnosina Journal of Medicine and Biomedical Sciences* 3, 214–214. <https://doi.org/10.4103/2277-9175.143262>