Effort To Prevent Post Partum Depression : Scoping Review

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Abstract : This study aims to review the research results on efforts taken to avoid the occurrence of postpartum depression. The review employs the PRISMA ScR framework, while articles are sourced through four databases: Pubmed, ScienceDirect, Wiley, and Google Scholar. The obtained data was analysed using Critical Appraisal at The Joanna Briggs Institute (JBI). Out of 3,509 pre-selected articles, only eight met the inclusion criteria. This review found several interventions that can be done to prevent postpartum depression, including educational videos about baby crying, progressive muscle relaxation, Spiritual Management of Relaxation Therapy (SMARTER), Moderate Physical Activity in an Aquatic Environment During Pregnancy (physical activity), Cognitive Behavior Therapy (CBT), effleurage method, and exercise and diet methods. Studies have demonstrated that these approaches effectively prevent or minimise postpartum depression.

INTRODUCTION

During the postpartum period, various changes occur in women after pregnancy and childbirth, both physiological, psychological and sociocultural changes. The complex changes in postpartum women require adaptation to adjust to conditions and lifestyle after pregnancy and childbirth. The postpartum period is a critical transition period for a mother. Not all mothers can adapt so that it can cause psychological disorders in mothers, both mild and severe psychological disorders. One of the psychological disorders that can occur in postpartum mothers is postpartum depression. Postnatal or postpartum depression is a psychological condition experienced by mothers that involves symptoms such as sadness, low mood, loss of interest in carrying out activities, difficulty sleeping, weight loss, feeling guilty or useless, easily tired, and decreased concentration in activities so that feelings of desire arise. Commit suicide or kill their baby (Ukatu et al., 2018).

WHO estimates that 10 per 1000 live births have mild postpartum depression, and 30 to 20 every 1000 live births have moderate or severe postpartum depression. Globally, postpartum depression among women ranges from 6.5% to 20%. In developing countries, 10-50% of mothers undergoing the perinatal period (from pregnancy until a year after giving birth) experience depression. Several studies in Indonesia show that Indonesia has a postpartum depression prevalence rate of 22.4% (Pratiwi, 2019). However, recent research conducted during the COVID-19 pandemic showed that Indonesian postpartum depression prevalence increased to 26.3%.

Postpartum depression can be influenced by low maternal education, age, history of child mortality, unwanted pregnancy and childbirth, employment, family support and parity (Dira IKPA & Wahyuni AAS, 2016). Postpartum depression can negatively impact the mother and the infant. It can impact the interaction between the baby and the mother during the first year of life. When the baby does not get enough stimulation, the child's growth and development

can be disrupted. Mothers with less interest and interest in their babies do not respond positively to their babies. Mothers unable to care for their babies optimally result in the babies' health and hygiene not being maintained optimally. Mothers demonstrate a lack of enthusiasm towards breastfeeding their babies, so the impact is that the baby's growth and development are disrupted. Mothers affected by postpartum depression may encounter disruptions in sleep, eating disorders, decreased appetite, feelings of depression, and other forms of sadness, leading to a diminished quality of life for the affected mother. Along the way, if postpartum depression is not handled properly, it can develop into postpartum psychosis and lead to a desire to commit suicide and kill her child by the mother.

Based on the causes and effects of postpartum depression and the factors that influence it, it is necessary to carry out serious efforts to prevent postpartum depression in mothers and aim to anticipate its occurrence proactively. These prevention efforts must be carried out so postpartum women can avoid the DPP condition. When a postpartum woman already knows what efforts to prevent DPP can be made, this can certainly increase their awareness to maintain the stability of their mental health condition. So, with active prevention efforts, the risk for a postpartum woman to experience DPP can also decrease. So, this scoping review aimed to explore evidence-based practices related to particular preventive measures that can be taken to prevent DPP.

METHOD

This study uses a scoping review using the PRISMA-ScR protocol with the PEO framework (Population, Exposure and Outcome). Population: Women in the perinatal period (pregnancy, childbirth and postpartum). During the article selection process, the researcher established specific criteria for inclusion and exclusion. The inclusion criteria entailed original research articles published between 2018 and 2023, with no restrictions on language or country, full-text availability, documents or reports from reputable organizations such as WHO, qualitative and quantitative research studies, experimental research, and relevant articles on preventive efforts against postpartum depression. Exclusion criteria are paper opinion literature review. Author databases are Pubmed, Wiley, ScienceDirect and Google Scholar. From June to July 2023, a thorough search of databases was carried out to gather relevant articles. The search used specific keywords to identify the most appropriate and related literature: Women's OR Maternal OR Mothers OR Women AND prevention OR prevention strategy OR management AND Postpartum depression OR depression OR PPD. Zotero, a reference management software, was employed in the article selection process. This software facilitated tasks such as identifying and eliminating duplicate articles, evaluating titles and abstracts, and accessing and reading the full text of selected articles. The findings of the article selection process were then visually presented using the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) flowchart, which the number of articles included and the filtering process applied (Tricco et al., 2018) as follows:

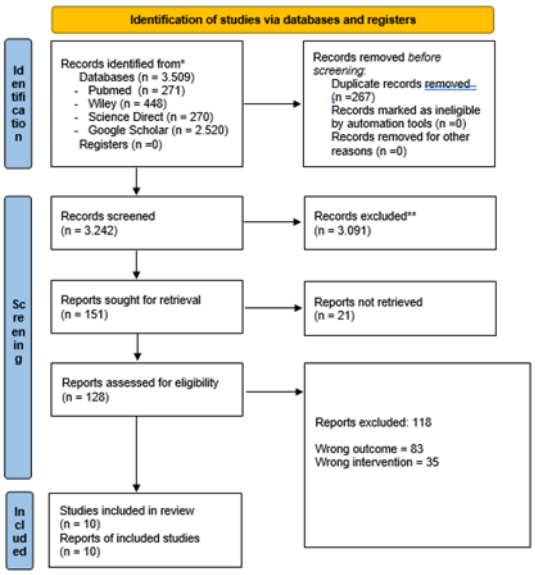

Figure 1. Prisma ScR Flowchart (Tricco et al., 2018)

Table 1: Data Charting

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
1	Efficacy of Regular Exercise During Pregnancy on the Prevention of Postpartum Depression Carolina de Vargas Coll et.al/ 2019/ Brazil	To evaluate the effectiveness of a 16-week intervention during pregnancy on the prevention of postpartum depression using data from a large RCT.	Randomized Clinical Trial	Pregnant women between 16 and 20 weeks of gestation without contraindications to exercise were randomly assigned to the intervention or control group in a ratio of 1:2. This randomization was done by a computer-generated process that utilized a block size of 9.	A total of 639 participants, with a mean age of 27.1 years and an average gestational age of 16.5 weeks, were randomly assigned to either the intervention group (n = 213) or the control group (n = 426). However, the protocol's adherence rate, defined as having engaged in at least 70% of the training sessions, was low at 40.4%. The mean score for postpartum depression did not differ significantly between the intervention and control groups (mean difference, -0.6; 95% CI, -1.3 to 0.1), and the rate of postpartum depression was also found to be similar in both groups (12 out of 192 [6.3%] in the intervention group, and 36 out of 387 [9.3%] in the control group) (odds ratio, 0.65; 95% CI, 0.33-1.28). The analysis of the instrumental variables revealed that nonadherence may have negatively impacted the estimated effect obtained in the primary analysis.
2	Preventing postpartum depressive symptoms using an educational video on infant crying: A cluster randomized	To test the impact of watching videos education on infant crying within 1 week after delivery on the ward delivery to reduce the prevalence of postpartum depressive	Randomized Controlled Trial	Participants were mothers who delivered their babies between October 1, 2014 and January 31, 2015, at a maternity hospital in Osaka Prefecture, Japan. We excluded women who delivered stillbirths and delivered at <22	In the intervention group, 142 (13.7%) mothers reported postpartum depression compared to 250 (16.0%) in the control group. After conducting an intention-to-treat analysis, no

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
	controlled trial/ Satomi Doi, et al / Jepang / 2019	symptoms at one month after giving birth to		weeks' gestation (ie, miscarriage).	significant difference was found in the prevalence of postpartum depression between groups. However, in the analysis conducted specifically on young mothers aged less than 25 years, there was a significant reduction of 67.0% in postpartum depression (odds ratio: 0.33, 95% CI: 0.15-0.72)
3	The effect of progressive muscle relaxation on the postpartum depression risk and general comfort levels in primiparas/ Ilknur Göks _ ,in., Sultan Ayaz-Alkaya / Turkey/ 2020	Evaluating the effect of progressive muscle relaxation (PMR) on the risk of postpartum depression and general comfort level in primiparas	Quasi-Experimental with pretest, posttest and control group	The study population was primiparous women who gave birth vaginally at the midwifery service at the training hospital and as many as 92 women (46 in the intervention group, 46 in the control group).	There was a statistically significant difference between the Edinburgh Postnatal Depression Scale pretest and the score obtained during the third follow-up of the intervention. Group ($p < .05$. There was a statistically significant difference between the mean General Convenience Questionnaire scores of the intervention and control groups at the first, second, and third follow-up ($p < .05$). This suggests that using PMR (Progressive Muscle Relaxation) may be effective in reducing the risk of postpartum depression and improving overall convenience. PMR can be provided to postpartum mothers through home visits to help them address mental health issues once they return home.
4	Moderate Physical Activity in an	To determine whether physical activity during	Randomized Controlled Trial	65 women in the intervention group 64	The study found significant differences in the

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
	Aquatic Environment During Pregnancy (SWEP Study) and Its Influence in Preventing Postpartum Depression/ María José Aguilar-Cordero, et al / Spanyol/ 2018	pregnancy reduces PPD		women in the control group	scores of the Edinburgh Postnatal Depression Scale between the exercise group and the control group (P < .001). Additionally, significant differences were observed between the exercise and control groups in the overweight and obesity categories, as measured by the index body mass (P < .05).
5	Efektivitas Intervensi Spiritual Management Of Relaxation Therapy (SMARTER) Dalam Upaya Mencegah Depresi Ibu Postpartum/ Ardan, M dkk/ 2021/ Indonesia	Analyze the effectiveness of Spiritual interventions Management of Relaxation Therapy (SMARTER) to prevent postpartum depression.	Quasi-experimental pretest-posttest with control group design	This study took 34 samples (postpartum mothers) for both groups (17 respondents in the intervention group and 17 respondents in the control group).	The analysis using the paired t-test showed differences in the level of depression before and after the SMARTER intervention in the intervention (p-value-0.000) and control groups (p-value 0.004). In contrast, the analysis using the unpaired t-test showed differences in the level of depression after the SMARTER intervention between the intervention and control groups with a p-value of 0.000. This research can also provide recommendations to health workers, especially midwives, in order to provide services in the form of complementary care services.
6	Exercise, Mediterranean Diet Adherence or Both during Pregnancy to Prevent Postpartum Depression—	1. To explore the effects of exercise interventions administered during pregnancy on postpartum depression;	Quasy Eskperimental	This study was conducted at the "University Research Institute of Sport and Health" (Granada, Spain) and the "University Hospital of San Cecilio and Virgen de las Nieves" from	The Mediterranean Diet (MD index) was derived to assess MD adherence. We used the Edinburgh Postnatal Depression Scale to assess postpartum depression. P>0.05).

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
	GESTAFIT Trial Secondary Analyses/ Marta Flor-Alemany/ 2022/ Spanyol	2. Investigate the correlation between adherence to MD during pregnancy and postpartum depression.; And 3. To determine if the impact of exercise on postpartum depression is influenced by adherence to a Mediterranean diet during pregnancy.		November 2015 to April 2018. Of the 384 pregnant women assessed for eligibility, 159 met the Inclusion-exclusion criteria. Among them, a total of 85 women who provided valid data on sociodemographic characteristics, MD adherence at the 16th week of gestation (gw), and postpartum depression assessed at the sixth week postpartum were included in this analysis.	Higher fruit consumption (β = -0.242, P = 0.022), Consuming less red meat and its by-products (β = 0.244, P = 0.020), and greater MD adherence (β = -0.236, P = 0.027) were associated with lower rates of postpartum depression. Following a Mediterranean diet more closely during pregnancy is linked to a lower prevalence of depressive symptoms and a lower risk of postpartum depression. \ Postnatal depression is not relieved by prenatal exercise. Promoting fruit consumption while controlling red meat intake during pregnancy can prevent postpartum depression.
7	Preventing Postpartum Depression in the Early Postpartum Period Using an App-Based Cognitive Behavioral Therapy Program: A Pilot Randomized Controlled Study/ Xiaoli Qin/ China / 2022	1. To explore the initial effectiveness of the CareMom program on universal prevention of postpartum depression through a randomized control study and 2. To evaluate the acceptance of the CareMom program.	Randomized Controlled Study	A total of 112 eligible postpartum maternal participants recruited during their hospitalization for up to 3 days were allocated randomly into two groups (CareMom: n = 57; control: n = 55)	During the fourth week, the CareMom group had a significantly lower EPDS score than the control group (P = 0.037). In addition, the EPDS (P<0.001) score of the CareMom group was significantly lower than the baseline. However, The control group did not demonstrate a noteworthy decrease in this score. Although the CareMom and control groups did not experience any significant decline in their GAD-7 scores, this study offers

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
					initial proof that CareMom can help decrease postpartum depressive symptoms during the early postpartum phase for most women.
8	Effects of Massage Therapy on Depression in Postpartum Mothers/ Ni Putu Mirah Yunita Udayani/ 2022/ Indonesia	To determine the effect of massage therapy on the level of postpartum maternal depression	Quasy Experiment dengan Pre-Posttest Design With Non-equivalent Control Groups	The sample consisted of 72 postpartum mothers who were divided into 2 groups. 36 respondents to the treatment group giving massage therapy, and 36 respondents to the control group	The statistical test results showed that there was a significant difference in the decrease in the EPDS score in the two groups (p-value 0.000)
9	Efektivitas Massage Terapi Effleurage Guna Mnecegah Kejadian Depresi Postpartum Pada Ibu Nifas / Kusumastuti/ 2019/ Indonesia	Knowing the effectiveness of effleurage massage therapy to prevent the incidence of postpartum depression in postpartum women	Quasy Experiment with Non-Equivalent Control Group Design using Pre Test-Post Test Only	The total sample was 22 postpartum mothers in each intervention/treatment group and the control group who had met the inclusion and exclusion criteria. This research was conducted from March-August 2018	The research results with the paired t-test showed that in postpartum mothers with effleurage massage therapy, the p-value was 0.000 with a significance level of p <0.005 while the t-count value was 2.67080. It can be concluded that massage therapy using the effleurage technique on postpartum mothers is twice as effective in preventing postpartum depression as compared to other methods.
10	Randomized trial examining the effect of exercise and wellness interventions on preventing postpartum depression and perceived stress/ Beth A. Lewis / 2021 / Amerika Serikat	To test two low-cost, brief, and easily accessible interventions designed to prevent postpartum depression and perception of stress among high-risk women	Randomized Trial	Participants (N=450) were recruited from the community and randomized to one of three conditions following, each lasting 6 months	n total; 2.4% of the participants were diagnosed with depression at the 6-month mark and 3.6% at 9 months with no difference between groups. At 6 months after randomization, the median depressive symptoms were significantly lower among participants health than usual care participants (b=-1.00, SE=0.46, P=.03). Exercise participants had significantly

Article Code	Title/Author/ Country	Tujuan	Methods	Sampel	Hasil
					lower levels of perceived stress at the 6-month mark post-randomization compared to usual care participants (b=-2.00, SE=.98, P=.04) and participants who received health advice (b=-2.20, SE=1.11, p=.04).

RESULTS

Based on the screening stages of the Prisma Flow Chart, 10 articles were obtained that met the criteria for conducting Critical Appraisal using The Joana Briggs Institute (JBI). The critical appraisal results (Table 2.) show that the questions at the Joana Briggs Institute were answered perfectly in articles (1,2,3,6,9,10). This article has several strengths, including comprehensive data sources from multiple samples, validated data collection methods and sampling techniques, and the use of validated instruments in each article, all of which help to minimize the possibility of errors. Imperfect results are found in articles (4,5,7,8).

Table 2: Critical Appraisal Assessment

Article Code	Critical Appraisal Tools	Result
1	JBI Tools RCT	28/28
2	JBI Tools RCT	28/28
3	JBI Tools Quasi-Experimental	18/18
4	JBI Tools RCT	27/28
5	JBI Tools Quasi-Experimental	16/18
6	JBI Tools Quasi-Experimental	18/18
7	JBI Tools RCT	26/28
8	JBI Tools Quasi-Experimental	16/18
9	JBI Tools Quasi-Experimental	18/18
10	JBI Tools RCT	28/28

The characteristics of the 10 articles reviewed were based on country names, including 1 article each from Brazil, Japan, Turkey, the United States and China, 2 from Spain and 3 from Indonesia. The research design used Quasy Experimental 5 and Randomized Controlled Trial 5 articles.

Postpartum Depression Prevention Efforts

1. Exercise and Diet

Article (1) shows an aerobic and endurance exercise/exercise program for pregnant women between 16-20 weeks of gestation. After conducting the exercise three times a week for 16 weeks, with each session lasting for 60 minutes, it was discovered that there was no notable discrepancy in the level of postpartum depression between pregnant women who did exercise and those who did not (Coll et al., 2019). In the article (6), it is explained that an exercise program carried out 3 days/week in 60 minutes/session starting from 17 weeks of gestation until delivery and with adherence to maintaining a Mediterranean diet during pregnancy (intake of red meat and its sub-products and fruit) is linked to increasing depressive symptoms. It leads to a decreased risk and fewer instances of postpartum depression. Prenatal exercise does not alleviate postnatal depression. However, promoting the consumption of fruits and controlling the intake of red meat during pregnancy can serve as a preventive measure against postpartum depression (Flor-Alemany et al., 2022). Whereas in the article (10), exercising less than 10 minutes per week significantly reduces symptoms of postpartum depression (Lewis et al., 2021).

2. Educational Video about Baby Crying

In article (2), it is explained that Various factors that cause postpartum depression contribute to the risk of postpartum depression, such as being young, having a first delivery, a history of depression or anxiety, a family history of depression, and negative childhood experiences. Other risk factors include experiencing intimate partner violence, financial problems, a lack of social support, and having a reactive response to a baby crying (Doi et al., 2020). Inconsolable crying babies associated with parental pressure and low competence in parenting skills suggest that crying babies could increase the likelihood of maternal postpartum depression. Therefore, educational resources about crying babies, particularly how to handle inconsolable crying, may help to decrease the risk of postpartum depression. Additionally, understanding the reasons behind crying babies can change how individuals perceive and respond to crying, and this understanding can be further developed through educational materials (Barr et al., 2009). An educational video about baby crying called "Baby Don't Stop Crying" is based on the PURPLE Crying Period. The 11-minute educational video, "Babies Don't Stop Crying," details the crying patterns in healthy babies and may help prevent postpartum depression. As such, it may be a simpler tool to utilize than "Baby Business.", and PDD prevention interventions' efficacy must be assessed.

3. Progressive Muscle Relaxation (PMR)

Article (3) discusses the variation in the duration and frequency of Progressive Muscle Relaxation (PMR) described in the literature. This study was conducted for 8 weeks after delivery, as postpartum depression generally begins within the first 6 weeks after delivery. The women were instructed to perform PMR at home using an MP3 player and headset, with each session lasting for approximately 30 minutes and taking place thrice weekly. PMR should be performed in a tranquil, distraction-free environment with dim lighting, adjusted temperature, and comfortable clothing for optimal results (Gökşin & Ayaz-Alkaya, 2020). In this research, the mothers were advised to practice PMR in bed after the baby had fallen asleep at a convenient time during the day. The second home visit was carried out on the 10-15th day postpartum. After undergoing PMR, the EPDS and General Comfort Scale were administered again at this visit. The third home visit was carried out on the fourth week of postpartum, and the fourth home visit was carried out on the eighth week of postpartum; PMR was reapplied, application continuity and potential problems were followed up, and the EPDS and General Comfort Scale were administered again. PMR presents the opportunity to mitigate the risk of postpartum depression and improve overall well-being. It may be possible to conduct PMR via home visits to assist postpartum mothers in coping with mental health issues after they return home (Curry et al., 2019).

4. Moderate Physical Activity in an Aquatic Environment During Pregnancy (SWEP Study)

Article {4} examines the prevention of postpartum depression using Moderate Physical Activity in an Aquatic Environment During Pregnancy (SWEP Study) intervention. This intervention involves physical exercise within a water-based environment from the 20th to the 37th week of pregnancy. The method includes three 1-hour sessions per week based on the activities described in the SWEP method (Aguilar-Cordero et al., 2019). The objective of the intervention, "Moderate Physical Activity in an Aquatic Environment During Pregnancy" (SWEP Study), is to facilitate easier management of physical and psychological changes that occur during pregnancy. This intervention aims to achieve this by incorporating specific exercises conducted in a water-based environment, allowing for better control over these changes throughout pregnancy by carrying out scheduled physical activities where each session comprises three stages: a warm-up phase, the main phase, which includes aerobic sessions as well as strength and

endurance training, and lastly, a cool-down phase with stretching and relaxation exercises. In this study, this intervention proved to be effective as a preventative measure for postpartum depression because it can reduce depression scores compared to women who do not move much or do not do physical exercise. A study's findings demonstrated the effectiveness of the exercise routine, which revealed that the average Edinburgh Postnatal Depression Scale (EPDS) score for women who did not engage in physical activity was 10.17 ± 2.38. In contrast, those who followed the SWEP method had an average score of 6.41 ± 3.68. Thus, the Exercise Group (EG) scored, on average, 3.76 points lower on the EPDS compared to the Control Group (CG), with a p-value of less than 0.001, so those who did physical exercise had a lower risk of DPP. So, it can be concluded that this intervention indicates that moderate physical activity in a water-based setting during pregnancy can help alleviate postpartum depression symptoms.

5. Spiritual Management of Relaxation Therapy (SMARTER)

Article {5} discusses efforts to prevent depression in postpartum mothers through Spiritual Management of Relaxation Therapy (SMARTER) interventions. The Spiritual Management of Relaxation Therapy (SMARTER) intervention is a method that combines spirituality and psychology that connects humans with their God in the form of prayer, remembrance, and belief. The aim is to generate hope and self-confidence to accelerate the resolution of the patient's physical/psychological problems. The way this Spiritual Management of Relaxation Therapy (SMARTER) intervention works is by combining various methods, including the Spiritual Emotional Freedom Technique (SEFT) and Enlightenment of the Padang Lampe Heart of Mind (PQPL) to provide education and service to the community to provide a sense of relaxation, a sense of calm, and feel energized again by providing simple movements to help solve physical and psychological pain problems, improve performance and achieve peace in life. In this study, this intervention proved effective as a preventive measure for postpartum depression because it can affect the depression level of postpartum mothers. This is evidenced by the reserach results, which showed a difference in the decrease in postpartum maternal depression before and after the SMARTER intervention between the intervention and control groups with a p-value of 0.000. So, it can be concluded that this intervention can prevent or reduce depression in postpartum mothers; this can also be seen in the intervention group, which is dominated by postpartum mothers who experience symptoms with borderline depressive boundaries and, after SMARTER intervention, turn into mild mood disorders (Ardan et al., 2021).

6. Application-Based Cognitive Behavioral Therapy (CBT)

Article (7) details the utilization of mobile technology, specifically the CareMom program, an app-based cognitive behavioral therapy program, in preventing postpartum depression among women. In a randomized controlled pilot study, the initial effectiveness of the program was examined in minimizing maternal depressive symptoms during the early postpartum phase. Participants were recruited within 3 days of delivery and randomly assigned to the wait-list control or CareMom groups. Over a four-week intervention period, those in the CareMom group completed daily challenges via the app. Participants' depression (using the EPDS) and anxiety (using the GAD-7) levels were assessed at the beginning and every 7 days for four weeks. The CareMom group experienced a significant decrease in symptoms compared to baseline, while the control group showed no significant reduction. However, at week 4, no significant change in GAD-7 scores was observed for either CareMom or control groups. This study offers initial evidence supporting the effectiveness of the CareMom program in reducing depressive symptoms among the general postpartum population during the early postpartum stage (Qin et al., 2022).

7. Effleurage Massage

Articles {8,9} discuss efforts to prevent postpartum depression using massage techniques, specifically effleurage massage. The effleurage technique in massage is to apply massages to the muscles along the spine, stimulating the spinal cord. The spinal cord serves as a connection between the brain and the peripheral nervous system. Effleurage massage, done twice a week for 30 minutes, affects postpartum depression (Udayani et al., 2023). The research results by Kusumastuti et al (2019) found that massage therapy using the effleurage technique in postpartum women had 2x higher effectiveness for preventing postpartum depression in postpartum women, as evidenced by the paired t-test. It was found that postpartum women with effleurage massage therapy scored a p-value of 0.000, with a significance level of p <0.005, while the t-value was 2.67 (Kusumastuti & Dewi, 2021).

DISCUSSION

Pregnancy and childbirth is a crisis period for a woman. Because in this period there will be an increase in stress and excessive anxiety due to physical and psychological changes that happened. Stress and feelings of anxiety that arise will narrow the coping mechanisms, and ultimately increase the risk of depression. One of the depression that is very vulnerable to experienced by a woman is postpartum depression. Postpartum depression is a mental disorder that arise a few days or in the first week after a woman gave birth or did labor. DPP is characterized by mood swings which are where the postpartum woman's emotions will be becomes unstable, often feeling sad and confused about his condition.

In DPP conditions, if not handled properly, the symptoms can continue persist and eventually develop into a more severe mental disorder, namely psychosis. Which of course it can have a very bad impact, both on the mother's life and baby's life. Therefore, to avoid the occurrence of such adverse conditions, proper prevention efforts are needed to be given to a postpartum woman so that not to experience this condition. Because, actually the number of DPP nowadays is increasing increases and needs to be reduced so that the level of welfare of postpartum women can increase and the incidence of DPP can also decrease. A number of studies have been carried out by many researchers, and based on the results of studies on the articles that have been found, show that there are several interventions that are deemed acceptable applied as an effort to prevent postpartum depression in postpartum women.

First, through intervention exercise and diet. Exercise and a healthy diet can partly alleviate depressive symptoms in non-pregnant adults. During pregnancy, exercise seems to reduce both postpartum depression prevalence and depressive symptoms. A recent systematic review of meta-analyses found that exercise had a small but significant effect on postpartum depressive symptoms. However, this is inconclusive, as neither aerobic nor strength training exercises showed a protective effect on postpartum depression. The Mediterranean diet (MD) is a dietary pattern with strong evidence supporting its effect on depression in adults. However, applying these benefits to pregnant women is difficult, as previous literature reports varied findings. Therefore, it is essential to study the combined effects of healthy nutritional patterns (e.g., MD adherence) alongside pregnancy-adjusted exercise to determine the potential positive moderating effect of MD adherence. Higher fruit consumption and lower red meat and byproduct intake during pregnancy are associated with fewer depressive symptoms and a reduced likelihood of depression in the early postpartum period. Maternal nutrition may affect the development and trajectory of postpartum depression. Hamazaki et al. found that higher fish and/or n-3 polyunsaturated fatty acid consumption during pregnancy was linked to lower postpartum depression risk. Better diet quality has been connected to a decreased likelihood of depressive disorders among non-pregnant adults. Consuming fewer pro-oxidant-rich foods (e.g., red meat and its by-products)

and more antioxidant-rich foods (e.g., fruits) may be recommended during the perinatal period. In this regard, the MD can be highly beneficial, as it has been shown to neutralize oxidative stress and lower depression risk. It may explain why the MD, characterized by antioxidant nutrients, dietary fibre, and diverse fat composition, among other factors, is associated with reduced postpartum depression rates (Flor-Alemany et al., 2022).

Exercise could be a non-pharmacological method for women to manage their mood after pregnancy. Aerobic and strength training have been found to reduce depressive symptoms and improve mood in individuals diagnosed with depression (Coll et al., 2019). However, studies investigating the role of exercise during pregnancy to prevent postpartum depression remain inconclusive. A systematic review found that exercise reduced postpartum depression scores on the EPDS by four points. Past research has shown that exercise-only interventions during pregnancy did not directly impact the severity of postpartum depressive symptoms. Therefore, interventions that combine diet and exercise may be more effective in preventing postpartum depression than those focusing on exercise alone. However, there is limited evidence on the interaction between diet and exercise concerning postpartum depression. While not statistically significant, participants in the intervention group with high adherence to the Mediterranean diet (MD) had three points lower postpartum depression scores compared to the control group with low MD adherence. The lack of statistical significance could be due to our limited sample size and the relatively large effect size (70% lower risk).

The second is prevention through postpartum depression with Educational Video about Baby Crying. A 2019 study by Satomi Doi found that an educational video about baby crying, titled "Baby Don't Stop Crying," did not significantly prevent postpartum depression symptoms in general. However, it showed a protective effect against postpartum depression symptoms among younger mothers under 25, which was not observed in mothers aged 25 or older. Specifically, educational videos on crying babies reduced postpartum depression symptoms by 72.0% among younger mothers. This finding is particularly important as Japanese mothers often stay in obstetric hospitals for several days after giving birth, providing an excellent opportunity to show them an 11-minute video. Therefore, watching educational videos about crying babies could effectively prevent postpartum depression symptoms in young mothers. The different effects of educational videos on postpartum depression symptoms by age could be due to variations in parenting stress and sensitivity to crying. These factors might change as a result of exposure to educational videos. Younger mothers are more likely to experience caregiving-related stress, including managing crying babies. Giardino et al. (2008) also found that adolescent mothers tend to have dysregulated responses to infant crying compared to non-adolescent mothers. These findings suggest that younger mothers may struggle to cope with crying babies, as shown in previous studies that reported less skin contact between younger mothers and their babies during crying episodes, leading to increased stress. On the other hand, younger mothers might have greater knowledge about crying and be more receptive to digital educational materials, such as watching videos on tablet devices, as Salonen et al. (2014) suggested.

Further research is necessary to determine why educational materials about crying babies effectively prevent postpartum depression symptoms. Interestingly, the intervention did not prevent postpartum depression symptoms in older mothers. It might be due to differences in characteristics between younger and older mothers. For example, older mothers are less likely to be unmarried (1.6% vs. 10.6%) and less likely to live with grandparents (8.8% vs. 24.4%). These factors suggest that older mothers may have more stable nuclear families with less family conflict (Doi et al., 2020), which could lead to decreased parenting-related stress, including coping with crying babies. Even if younger mothers gain knowledge about healthy

infant crying patterns and learn techniques to soothe the baby without rocking or smothering through educational videos, such knowledge and skills may not help prevent postpartum depression symptoms. This explanation is supported by the fact that the prevalence of postpartum depressive symptoms is lower in older mothers (14.7%) than in younger mothers, indicating a possible floor effect.

In conclusion, the risk of postpartum depression can be reduced by watching educational videos about crying babies within the first week after delivery, particularly for young mothers under 25. It was found that around 72.0% of young mothers experience symptoms of postpartum depression. However, it is important to note that watching educational videos about baby crying did not significantly reduce symptoms among adult mothers. Therefore, further research is necessary to explore and develop additional interventions specifically targeted at reducing postpartum depression symptoms in adult mothers.

Third intervention is Progressive Muscle Relaxation (PMR). Progressive Muscle Relaxation (PMR) is a commonly used relaxation technique . In the literature, El-Aziz and Mamdouh (2016) showed that meditation and physical relaxation exercises significantly reduced depressive symptoms in first-time mothers diagnosed with PPD after vaginal delivery. Kordi et al. (2012) reported that PMR, combined with the imagination method, decreased the risk of PPD. Other studies conducted with different groups found that PMR reduced anxiety and depression levels (Pao et al., 2019). PMR is valued for its safety, ease of application, and lack of side effects. It can reduce the risk of PPD by positively impacting postpartum women's mental health and enhancing their stress-coping abilities. The absence of differences in the mean EPDS scores in the control group could be attributed to women's difficulties in adjusting to the postpartum period and maintaining mental health due to factors like inadequate social support, self-care challenges, and the struggles of caring for a newborn.

Fourth intervention is Moderate Physical Activity in an Aquatic Environment During Pregnancy (SWEP Study). Overweight and obesity are closely linked to a higher risk of PPD, making it crucial for pregnant women with a BMI of 25 or higher to participate in specialized physical exercise programs, such as the SWEP method, to lower the risk of PPD. The SWEP method involves moderate physical exercise in a water environment for pregnant women from weeks 20 to 37 of pregnancy, with three 1-hour sessions per week (Aguilar-Cordero et al., 2019). Each session has three stages: warm-up, the main phase comprising aerobic exercises followed by strength and endurance training, and finally, stretching and relaxation. During pregnancy, the women receive typical recommendations, including guidance from midwives on the benefits of physical exercise. They also have standard consultations with healthcare providers like midwives, obstetricians, and family doctors. The SWEP method has been proven effective in preventing postpartum depression, as supported by a study by Nordhagen and Sundgot-Borgen, which indicates that women who engage in moderate exercise during their third trimester have lower depression scores six weeks postpartum than sedentary women. Physical activity offers various advantages for pregnant women, such as alleviating lower back and hip pain, enhancing metabolic and cardiopulmonary capacity, and reducing gestational diabetes risk. It also eases the birthing process, helps maintain the mother's physical condition, lessens daily activity fatigue, manages weight gain, improves body image perception, and decreases anxiety and depression.

The fifth intervention to prevent postpartum depression is Spiritual Management Of Relaxation Therapy (SMARTER). Early prevention efforts through the development of contemporary therapies, because they can be directly targeted by health services and therefore alleviate the burden of postpartum depression, are relatively easy, one of which is the Spiritual Management of Relaxation Therapy (SMARTER). SMARTER combines spiritual

energy and psychological energy that connects humans with their God. It is done in the form of prayer and remembrance as well as the conscious belief that contains spiritual elements to generate hope and self-confidence to accelerate the resolution of the patient's physical and psychological problems. So it can be done in various health services. SMARTER motivates humans to seek meaning and purpose in life. Spiritual is the "spirit" that synthesizes personality and directs energy to become more orderly. The spiritual dimension cannot be separated from the soul and body but provides an integrative power. Spiritualists are affected by physical conditions, feelings, thoughts and the relationship between the three (Recto & Champion, 2017). Spiritual management can be carried out in 3 (three) stages including: 1). Instill that Allah SWT is Most Gracious and Most Merciful; 2). Motivating that every human being must have strengths and weaknesses. Spiritual empowerment and alignment of the body's energy system to overcome physical problems (such as prolonged headaches, back pain, allergies, asthma, fatigue, etc.) and overcome emotional problems (trauma, depression, phobias, stress, difficulty sleeping, boredom, lazy, nervous, anxious, emotional, not confident, and so on. SMARTER's intervention in this study, which combines heart enlightenment spiritual therapy and Emotional Freedom Technique in providing postpartum mother care, resulted in significant results on changes in maternal depression. Spiritual therapy raises a pretty good response which has an impact on relaxation and health; this will give you a sense of confidence in self-care so that anxiety and worry about yourself will decrease and accept the situation, this spiritual guidance will increase motivation, enthusiasm and physical symptoms will make health better associated with depression (Rizzo et al., 2022). Spiritual beliefs, including belief in religious teachings, will shape one's concept of health. This matter will be influenced by the belief that everything that happens is by the will of God Almighty, who must be accepted and grateful for so that the level of despair and insecurity will decrease along with the spiritual motivation given (Liu & Yang, 2021). The patient will feel more relaxed and able to cope with the situation experienced after childbirth due to positive energy in the form of affirmations towards the patient's touches (Nabia Tariq et al., 2021)). This is done by doing therapy for the patient to provide psychological energy by prioritizing or utilizing what is in the human body so the power from within the patient will be more excited. Another study showed that the increase in mental health care for postpartum patients effectively reduces the rating scale scores from depression to anxiety rating scale scores and improves the quality of life of postpartum patients (Widianti et al., 2022).

The sixth intervention is Cognitive Behavioral Therapy (CBT). Cognitive-behavioral therapy (CBT) has been proven effective in preventing postpartum depression. Focused on the connections between thoughts, attitudes, behaviours, physical responses, and the environment, CBT offers education about each domain's interconnections while promoting strategies for positive change within them. CBT has been used to treat various mental disorders, such as depression, anxiety, and eating disorders, with success rates between 52% and 97% (Murwati, 2017). The fundamental theory behind CBT states that emotional distress and maladaptive behavior result from people's dysfunctional thought patterns. Individuals need to alter these dysfunctional cognitive patterns to enhance their emotional condition and behaviour. CBT equips people with the means and resources to assess, challenge, and revise these unhelpful cognitive patterns.

In this study, we introduce a new app-based program called CareMom, designed to provide CBT content for preventing postpartum depression during the earliest postpartum period. CareMom is a mini Chinese WeChat program accessible by scanning a QR code within the WeChat app. Shanghai Thoven Technology Co., Ltd., in collaboration with psychologists and psychiatrists from the Shanghai Mental Health Center, developed the program, which primarily features psychoeducation and cognitive

restructuring components. Cognitive restructuring, a core CBT strategy proven effective for depression, is often combined with behavioral techniques for intervention. However, due to the challenges of applying behavioral interventions during the early postpartum period, the CareMom program does not include behavioral intervention content. While third-wave CBT approaches, such as mindfulness-based cognitive therapy (MBCT), have been recommended for treating and preventing depression, they are not incorporated into the CareMom program due to the intervention program's limited duration.

CareMom is composed of two main components: daily challenges and mood management. These components are briefly explained below. Daily challenge component: The daily challenge component contains 28 challenges, with users completing one challenge each day. The first 14 challenges include a video and quiz questions. Each video lasts 2 to 4 minutes, covering CBT topics related to postpartum depression, such as human emotions, various cognitive distortions, and ways to challenge these distortions. The quiz questions assess users' understanding of the video content. The remaining 14 challenges consist solely of quiz questions. The program automatically releases a new challenge daily when users activate their accounts. If a user misses a daily challenge, they can complete it later. The mood management component allows users to record their daily mood and reflect on mood-related events and thoughts. When logging into the program for the first time each day, users are prompted to rate their overall daily mood from good, good, neutral, poor to bad. Suppose users select a negative emotion (bad or very bad). In that case, the program guides them through reflecting on events and thoughts associated with their negative emotions and helps them challenge and reconstruct their negative thoughts. Identifying, challenging, and reconstructing negative thoughts is a core principle of CBT for improving emotional states and behaviours. When users choose positive (good and excellent) or neutral emotions, the program encourages them to record the positive events of their day, drawing inspiration from positive psychology theory. Users can review their mood log using the mood calendar feature, and by clicking on an emoji in the calendar, they can view associated reflections. Gamification elements were integrated into the program design To motivate users to complete daily challenges and actively track their moods. Specifically, users receive 10 points as a reward for completing daily challenges and 5 points for recording their mood. Repeating completed daily challenges does not award points, and users can only track their mood once per day. The program automatically collects user activity data (Qin et al., 2022).

The last intervention is Effleurage Massage. Effleurage massage is a technique in which the therapist uses their hands to apply gentle circular pressure on the body's surface repeatedly. This technique aims to improve blood circulation, apply pressure, warm the abdominal muscles, and enhance physical and psychological relaxation for postpartum women (Kusumastuti & Dewi, 2021).

Effleurage massage focuses on the spinal muscles, stimulating the spinal cord, which connects the brain and the peripheral nervous system. All communication along the spinal cord is found in ascending tracts that transmit signals from afferent inputs to the brain. The spinal cord's central region contains interconnections between afferent input, output, and efferent neuron cell bodies. Afferent and efferent fibres, which carry signals to and from the spinal cord, form spinal nerves that connect to the spinal cord in pairs. Effleurage massage can reduce cortisol levels and increase mothers' relaxation. Another benefit of massage therapy is reduced stress levels, as indicated by decreased stress hormones (cortisol, adrenaline, and noradrenaline), promoting better sleep. Massage in this context involves manipulating soft tissues to soothe and diminish psychological stress by boosting endogenous morphine hormones like endorphins, enkephalins, and dynorphins while lowering stress hormone levels, such as cortisol, norepinephrine, and dopamine.

CONCLUSION

Prevention of depression in postpartum mothers needs to be done to minimize things that are not desirable both for the mother and the child, as one of the objects that become target when the mother experiences postpartum depression. Many efforts can be made to prevent or reduce postpartum mothers' depression. Based on the results of the analysis conducted to find out the various preventive measures that can be taken to prevent or reduce postpartum depression, several interventions have been found that have proven effective in treating postpartum depression prevent or reduce depression in postpartum mothers. Several interventions can be given, including educational videos about crying babies, progressive muscle relaxation, Spiritual Management of Relaxation Therapy (SMARTER), Moderate Physical Activity in an Aquatic Environment During Pregnancy (physical activity), Cognitive Behavior Therapy (CBT), effleurage methods, and exercise and diet methods. These interventions were shown to be effective in reducing depression in postpartum mothers. In the Spiritual Management of Relaxation Therapy (SMARTER) intervention, the IMD application, the effleurage method, the exercise method, and wellness are given to postpartum mothers. Meanwhile, physical activity, exercise and diet interventions are given to pregnant mothers but have an effect or influence in preventing post-pregnancy or postpartum depression. For further academics or researchers, research can be carried out that compares the level of effectiveness of each of the interventions above, and further research can be carried out regarding the factors related to the implementation of these interventions in maternity settings with a wider sample.

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