





## ORIGINAL ARTICLE

# Effectiveness of psychosocial support provided by midwives and family on preventing postpartum depression among first-time adolescent mothers at 3-month follow-up: A randomised controlled trial

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## Funding information

This study was supported by the Graduate School, Burapha University, Chonburi, Thailand, under grant GRD.BUU 0998/2562

## Abstract

**Aims and objectives:** To evaluate the effectiveness of a midwife-family provided social support programme (MFPSS programme) for first-time adolescent mothers on preventing postpartum depression (PPD) at 3-month postpartum.

**Background:** Adolescent mothers with lack of social support are a high-risk group for increasing the development of PPD. Interventions designed to promote social support and provided to mothers following childbirth have a more effective role in preventing PPD.

**Design:** The Consolidated Standards of Reporting Trials (CONSORT) guidelines for a single-blinded randomised controlled trial were conducted.

**Methods:** Forty-two adolescent mothers were randomly assigned to 4-week MFPSS programme plus routine care ( $n = 21$ ) and routine care only ( $n = 21$ ). PPD was measured using the Edinburgh Postnatal Depression Scale (EPDS), rates and severity at baseline, post-test, 6-week and 3-month postpartum follow-ups. Repeated measures ANOVA and Cohen's  $d$  were used to analyse the data.

**Results:** At the last follow-up, 20 (95.24%) participants remained in each group. Data were analysed based on 40 adolescent mothers. After the intervention, the mean EPDS scores in the intervention group were significantly lower than the same scores in the control group at post-test, 6-week and 3-month postpartum follow-ups. Similarly, the rates and severity of PPD in the intervention group were also lower than the control group at post-test, 6-week and 3-month postpartum follow-ups.

**Conclusion:** Psychosocial support interventions designed to incorporate support from midwives and family members is an effective intervention for preventing PPD in first-time adolescent mothers and the preventive effect is sustained for up to 3-month postpartum.

**Relevance to clinical practice:** Midwives or nurses could apply the MFPSS programme to nursing care for adolescent mothers and family members by adding health information about PPD and promoting social support.

**Clinical trial registration:** The trial was registered with Thai Clinical Trials Registry (TCTR). The trial registration number is TCTR 20190206004.

**KEYWORDS**

adolescent mothers, first-time mother, nurses, nursing intervention, postpartum depression, prevention, randomised controlled trial, social support

## 1 | INTRODUCTION

Adolescent and young mothers, particular for first-time mothers may be particularly vulnerable to physiological and psychological problems during both pregnancy and the childrearing period, because adolescent mothers encounter different difficulties compared to adult mothers, such as a transition to a new maternal role and new responsibilities to become a parent (Anglely et al., 2015; Erfina et al., 2019; Mangeli et al., 2017). Moreover, adolescents are not prepared emotional and psychological transition for parenthood, therefore, becoming a first-time adolescent mother is associated with adverse effects on mental health, such as stress, anxiety or postpartum depression (PPD; Dinwiddie et al., 2018; Parfitt & Ayers, 2014;). This paper reports the results of a randomised controlled trial (RCT) that evaluated the effectiveness of a midwife-family provided social support programme (MFPSS programme) for preventing PPD in first-time adolescent mothers.

## 2 | BACKGROUND

Postpartum depression is the most common mental health complications for many women after delivery. Although the American Psychiatric Association defines PPD as 'a major depressive disorder which occurs in women during pregnancy or within the first 4 weeks following childbirth' (American Psychiatric Association, 2013), but many experts in the field classify depression occurring within the first 12 months following childbirth as PPD (Phipps et al., 2013). Worldwide, the prevalence of PPD has a higher rate in adolescent mothers than adult mothers (Hymas & Girard, 2019; Swift et al., 2020) in which reported the rate of PPD rises to 10%–57% in adolescent mothers (Sangsawang et al., 2019).

Postpartum depression could contribute negative infant and maternal outcomes, which can have impact on maternal-infant bonding (Badr et al., 2018; Lehnig et al., 2019), maternal ability to care for infants, transition to the parenthood and coping with the stressors (Lee et al., 2020; Slomian et al., 2019). Subsequently, the infants of depressed mothers have been associated with delays in cognitive, emotional and social development (Ierardi et al., 2019; Liu et al., 2017; Slomian et al., 2019). Furthermore, mothers with untreated PPD may have higher risk in developing unhealthy behaviours such as excessive alcoholic consumption and substance abuse (Chapman & Wu, 2013), which further increasing the risk

### What does this paper contribute to the wider global clinical community?

- A midwife-family provided social support programme is a psychosocial support intervention that incorporates the support from midwives/nurses and primary family members.
- The findings show that the psychosocial support intervention was effective in preventing postpartum depression in first-time adolescent mothers and the preventive effects were sustainable until 3-month postpartum.
- Midwives or nurses should encourage adolescent mothers to express their need for social support and encourage primary family members to adequately provide social support to adolescent mothers.

for developing depression in her later life or suicide (Grigoriadis et al., 2017; Kim et al., 2015).

Social support is assistance from one individual to another involving one or more of the following: informational, instrumental, emotional or appraisal support (House, 1981) which can reduce the levels of maladaptation and prevent negative consequences due to life transitions and difficult situations such as during the postpartum period (Anglely et al., 2015; Negron et al., 2013; Tani & Castagna, 2017) and can also improve mental health and physical well-being during the transition into the new maternal role (Leahy-Warren et al., 2012; Siedlecki et al., 2014). Moreover, social support provided by family members (e.g. mothers, parents or husbands/partners) and health care providers is a significant source of assistance for all first-time mothers, particularly adolescent mothers (Hudson et al., 2016; Lee et al., 2020). Therefore, social support is considered as a modifiable risk factor for preventing PPD (Brown et al., 2018; Li et al., 2017). Effective preventive interventions which specifically developed for social support factor are likely to prevent the development of PPD. On the contrary, lack of social support is considered as one of the significant psychosocial risk factors for developing PPD in adolescent mothers (Diniz et al., 2015; Dinwiddie et al., 2018; Hymas & Girard, 2019). Adolescent mothers with inadequate social support during periods of pregnancy and childbearing have a high potential group to develop PPD (Campbell-Grossman et al., 2016; Huang et al., 2014; Kim et al., 2014). Consequently, interventions

that designed to promote social support and provided to women following childbirth has more beneficial role in preventing PPD than the interventions that incorporated during antenatal period (Schwab-Reese et al., 2017).

To date, a systematic review found the significant preventing methods of PPD were the psychological and psychosocial interventions (Dennis & Dowswell, 2013). The psychosocial intervention was a high potential but simple intervention for preventing PPD. Also, the other social supports including support from peer, telephone-based support from peer, health professional-support, educational support and home visit had been found to be the common interventions in different types of the psychosocial support interventions (Dennis & Dowswell, 2013). In 2019, another systematic review of the psychosocial and psychological interventions for preventing PPD particularly in adolescent mothers was conducted by Sangsawang et al. (2019). They revealed that the majority of the interventions were not designed to promote social support and were delivered to adolescent mothers only during pregnancy without extension to the postpartum period. Moreover, none of the interventions were designed to draw forth support from family members such as mothers, parents or husbands/partners in assisting adolescent mothers during antenatal or childrearing period, because health care providers such as midwives/nurses, obstetricians or paraprofessionals had a responsibility to directly provide all interventions to pregnant adolescents. Furthermore, the conclusion was that insufficient evidence to identify the most effective intervention for preventing PPD in adolescent mothers (Sangsawang et al., 2019). Interestingly, only three studies examined the effects of interventions focused on preventing PPD among adolescent mothers rather than focusing other parenting and infant outcomes (Ginsburg et al., 2012; Logsdon et al., 2005; Phipps et al., 2013).

To our knowledge, no RCT studies have evaluated the psychosocial support intervention on the prevention of PPD in first-time adolescent mothers. Therefore, our study is the first RCT to evaluate the effectiveness of a psychosocial support intervention for the prevention of PPD among first-time adolescent mothers. Therefore, we developed a nursing intervention, namely a MFPSS programme designed to incorporate the support from midwives and primary family members with delivery to first-time adolescent mothers during the early postpartum period. The expected outcome of the study could reduce the risk of first-time adolescent mothers for developing PPD.

## 2.1 | Aim and hypotheses

The aim of the study was to evaluate the effectiveness of the MFPSS programme among first-time adolescent mothers for preventing PPD at 3-month postpartum.

We hypothesised that the MFPSS programme could be more effective than routine nursing care only in preventing PPD among first-time adolescent mothers. We also hypothesised that the prevention can be maintained throughout the 3-month postpartum period.

## 2.2 | Objectives

Over 3-month postpartum, we compared the effectiveness of the MFPSS programme among adolescent mothers in the intervention and control groups on:

1. PPD, as measured by the Thai-version of the Edinburgh Postnatal Depression Scale (EPDS; Primary outcome).
2. The rate and the severity of PPD.

## 3 | METHODS

### 3.1 | Study design

A single-blinded, RCT with two parallel groups was conducted at the postpartum unit in a large tertiary hospital in Chon Buri, Thailand, between April and July 2019, and follow-up until October 2019. The Consolidated Standards of Reporting Trials (CONSORT) was considered as a guideline for the study (see File S1). The trial was registered with the Thai Clinical Trials Registry (TCTR): TCTR20190206004.

### 3.2 | Participants and recruitment

The participants consisted of first-time adolescent mothers and the primary family members of the adolescent mothers. The inclusion criteria for the adolescent mothers were as follows: (a) age of 10–19 years; (b) singleton pregnancy; (c) vaginal delivery; and (d) had primary family members such as a mother/father, husband/partner or grandmother to provide care and support during the postpartum period. The inclusion criteria for the primary family members in the intervention group were (a) age over 18 years; and (b) having a major role in providing care for the adolescent mother. The exclusion criteria for adolescent mothers were as follows: (a) received mental health services from health professionals; or (b) had serious complications after delivery such as postpartum haemorrhage, puerperal infection; or (c) had infants with congenital anomalies and serious health conditions.

### 3.3 | Sample size

A power analysis by the G\*power program 3.1.9.2 was performed to calculate the sample size. Using repeated measures ANOVA (within-between factors), four time points, 5% significance level with 80% power and a medium effect size of 0.21 based on a previous study (Logsdon et al., 2005), the total required sample size for both groups was 34. With a 20% added to account for the attrition rate to prevent participants lost during the follow-up, a total of 42 adolescent mothers were randomly allocated to either the intervention or the control group (21 per group).

### 3.4 | Randomisation and blinding

All eligible participants were randomly allocated to the intervention or control group (allocation ratio = 1:1) by a research assistant (RA), who was not involved in the care of the participants. Randomisation was done by using computer-generated numbers. The RA used the [www.randomizer.org/form.htm](http://www.randomizer.org/form.htm) (2018) to prepare the numbered sealed opaque envelopes used to perform block randomisation with a block size of 4. After written informed consent forms had been signed and obtained, the RA randomly drew up and opened the envelopes for each participant to ensure that they were equally assigned to the intervention or control group on the basis of group numbers: Group-1 as the intervention group and Group-2 as the control group. Therefore, all of the participants in the study were blinded to the group allocation.

### 3.5 | Intervention group

The theoretical framework that guided the development of the intervention was social support theory (House, 1981). Related literature described how the adolescent mothers required social support during the childrearing period (Logsdon et al., 2005), and systematic reviews regarding interventions for preventing PPD in adolescent mothers (Sangswang et al., 2019) were also used to develop the intervention for this study.

The midwives or researchers delivered the MFPSS programme to both the adolescent mothers and their families. The MFPSS programme consisted of the following two sessions: (1) social support activities for the adolescent mothers during their hospitalisation with telephone contacts and home visits after they returned home by the midwives and (2) social support activities for the mothers after they returned home by the primary family members. In Session 1, social support activities were provided three times for 60–90 min at a time during the 1st–3rd days after childbirth in the postpartum unit, plus 20–25 min of four telephone contacts during the 1st–4th weeks, and 60–90 min for one home visit at the first week. In Session 2, social support activities were provided to adolescent mothers over 4 weeks (1st–4th week). Therefore, the time period for the intervention was approximately 4 weeks. The details of the MFPSS programme are shown as follows:

#### 3.5.1 | Session 1: Administration of the MFPSS programme by midwives

The midwives provided social support for the adolescent mothers and their family members to prevent PPD through the MFPSS programme as follows:

1. Informational support: (a) education about PPD for the adolescent mothers and their family members; (b) explanation about the importance of social support in preventing PPD;

(c) persuasion about the importance of the roles of family members in providing social support in order to prevent PPD; (d) education about the methods to ask for help from the primary family member; (e) train and demonstrations of how to ask for help or social support from family members; and (f) provision of information about self-care and newborn care during the postpartum period with the handbook, 'Support Helps Prevent Postpartum Depression in Adolescent Mothers'. Informational support by providing the aforementioned education, demonstrations and knowledge enabled the adolescent mothers to seek and request social support from their families during the postpartum period. It also raised awareness for the families of the adolescent mothers about the importance of providing social support and their ability to provide the adolescent mothers with support and assistance.

2. Emotional support: providing care, attention and verbal encouragement, while asking questions and listening to the various problems of the adolescent mothers, then following up on the problem-solving of the adolescent mothers concerning infant care and seeking assistance from their families.
3. Instrumental support: providing assistance for adolescent mothers to practice newborn care such as holding, bathing, performing infant eyes and umbilical cord care, changing clothes, changing diapers and feeding, etc., along with practising ways to seek assistance from others.
4. Appraisal support: four follow-up telephone contacts and one home visit were aimed at making assessments and listening to the problems of the adolescent mothers and family members under real-living conditions at participant's home, while offering verbal encouragement, support and admiration of the good things done by the adolescent mothers and their families in addition to offering opportunities for the adolescent mothers to ask questions and offering advice on solving their problems at the time.

#### 3.5.2 | Session 2: Administration of the MFPSS programme by primary family members

Once the adolescent mothers had returned home, their families took on a significant role in providing social support in which the adolescent mothers had to select one person in the family to act as the primary family member to provide the mothers with social support after they returned home. Hence, the primary family member had to participate in the MFPSS programme first with the objective of preparing this primary family member by raising awareness about the importance of their role in providing social support to prevent PPD and to understand how to properly provide social support for the adolescent mothers. After participation in the MFPSS programme, the researchers found majority of the primary family members to feel confident that they would be able to provide social support activities for the adolescent mothers during the postpartum period.

Therefore, the researchers promoted and motivated the 21 primary family members selected by the adolescent mothers in the

experimental group who participated in the MFPSS programme and were the primary members who provided social support, assistance and care for the adolescent mothers who had been discharged from hospital as follows:

1. Informational support: advice was provided for the adolescent mothers about postpartum self-care such as changing sanitary napkins and breast care, etc. Suggestions were also provided on infant care such as breastfeeding, holding, bathing, wiping infants' eyes, umbilical cord care, changing clothes and changing diapers, etc.
2. Emotional support: providing care and attention, offering love, asking about problems, emotions, feelings and needs for various types of assistance for the adolescent mothers in combination with listening, understanding and accepting the things shared by the adolescent mothers.
3. Instrumental support: providing assistance in terms of general care for the adolescent mothers such as preparing food, doing laundry, cleaning house, providing financial aid and taking to the hospital by appointment, etc. The mothers also received help with newborn care to ease their burdens by holding their babies, putting the babies to bed, bathing, wiping the infants' eyes, performing umbilical cord care, changing clothes and changing diapers, etc.
4. Appraisal support: providing feedback, admiration and confidence for the adolescent mothers when they were able to perform self-care and care for their newborn infants.

### 3.6 | Control group

The adolescent mothers in the control group received routine nursing care only during the postpartum period at the postpartum unit by staff nurses who were not involved with the study. The mothers were instructed by the staff nurses with verbal instruction regarding the topics of maternal and infant health care throughout the early postpartum period (i.e. maternal-infant complications, breastfeeding, infant care skills, etc.). For the ethical consideration, those mothers in the control group were free to receive the MFPSS programme after finishing the study at 3-month postpartum.

### 3.7 | Outcome measurements

The outcomes were measured at four different time points: baseline (T0), immediately after the intervention (T1), at the 6-week postpartum follow-up (T2) and at the 3-month postpartum follow-up (T3).

#### 3.7.1 | Primary outcome

The primary outcome was the effectiveness of the MFPSS programme on the prevention of PPD, which was measured by changes

in EPDS scores. The EPDS is a 10-item instrument used to measure PPD symptoms in women after childbirth (Cox et al., 1987). The 10 items of the EPDS were rated on 4-point Likert scales with scores ranging from 0–3 points. The EPDS scores ranged from 0–30 points. The cut-off point score for indicating depressive symptoms is 13 or above in which higher scores indicate more depressive symptoms (Cox et al., 1987). In the current study, the researchers obtained the EPDS-Thai version that had been translated and validated by Vacharaporn et al. (2003). The EPDS-Thai version in the study was validated with good reliability and validity with Cronbach's  $\alpha$  at 0.82.

#### 3.7.2 | Secondary outcome

The secondary outcomes were the rate and severity of PPD. The rate of PPD was the percentage of adolescent mothers who experienced PPD with EPDS scores of  $\geq 13$ . The severity of PPD was measured by the EPDS scores, which were categorised into the following four levels: no depression (scores  $\leq 13$ ), moderate depression (scores ranging from 13–14), marked depression (scores ranging from 15–16) and severe depression (scores  $\geq 17$ ; Netsi et al., 2018).

### 3.8 | Data collection

Before starting the intervention, the adolescent mothers in both groups were asked to complete the personal information form and the EPDS during hospitalisation at the postpartum unit (T0). Next, the adolescent mothers received three EPDS questionnaires for measuring PPD by self-report at the following three time periods (T1–T3). All of the adolescent mothers were contacted by the second RA, who was blinded to group allocation, via telephone at 4 weeks, 6 weeks and 3 months after delivery to ask them to complete the EPDS to screen for PPD. The adolescent mothers in both groups were paid USD 20.00 for completing the 3-month postpartum assessment.

### 3.9 | Ethical consideration

The study was approved by the Institutional Review Committees (Approval No: 02-11-2561 and No: 22/62/O/h3). The researchers protected the participants' rights by explaining the objectives and procedures of the research prior to the beginning of the study. Participation in the study was voluntary and the participants had the right to refuse participation in the research at any time. All collected data were kept strictly confidential with the access limited to the researcher only and the findings were reported as group data. All participants gave informed written consent before starting the study.

Considering ethical issues, moreover, the depressed adolescent mothers who obtained EPDS scores  $\geq 13$  during the data collection process their problems and symptoms of depression such as mood of depression, loss of satisfaction/interest or suicidal ideation assessed

by the researcher. Moreover, they were referred for consultation and further clinical evaluation with psychiatric nurses or psychiatrists, depending on the decision of the adolescent mothers concerning whether they would require these services.

### 3.10 | Data analysis

Data analyses were performed by using a Statistical Package for Social Science (SPSS) version 24.0 with a statistical significance level of .05. All data were analysed based on the assumptions of each statistic. Descriptive statistics, including frequency, percentage, mean and standard deviation (SD) were used to describe and analyse the participants' characteristics. The homogeneity between the two groups was compared by using chi-square or Fisher's exact test for categorical variables and independent *t*-test for continuous variables. The EPDS scores were analysed by mean, SD and range. The proportion of participants who experienced PPD between the two groups was also analysed by using frequency and percentage. A repeated measures ANOVA (one within-subjects variable and one between-subjects variable) with  $2 \times 4$  design (group  $\times$  time) was performed to evaluate the effectiveness of the MFSS programme on the mean EPDS scores between the two groups across four time points. The effect size (Cohen's *d*) was also used to analyse. Cohen's *d* > 0.20, 0.50 and 0.80 were interpreted as small, medium and large effects, respectively (Cohen, 1988).

## 4 | RESULTS

Initially, 78 adolescent mothers were screened during the data collection process. Twenty-six adolescent mothers were excluded from the study because they failed to meet the requirements for inclusion and ten declined to participate in the programme. Finally, a total of 42 adolescent mothers who met the criteria were randomly allocated into the intervention or control group.

All of the adolescent mothers and their primary family members in the intervention group participated in all activities of the MFSS programme ( $n = 42$ ). Therefore, the attendance rates in the intervention group were high. At the end of the study, one adolescent mother in the intervention group and one adolescent mother in the control group were absent for follow-up at T3. Consequently, the participants' demographics, characteristics of the dependent variables and examination of the effectiveness of the MFSS programme were analysed based on 20 participants in both groups (Figure 1).

### 4.1 | Participant demographics

The average ages of the adolescent mothers in the intervention and control groups were 17.15 and 17.65 years, respectively. The

majority of the adolescent mothers in both groups were unemployed (75%), had unplanned pregnancies (65%) and were living with partners (72.5%). The largest proportion of the primary family members who provided social support in both groups were mothers (50% and 45%, respectively), followed by partners/fathers of the babies (25% and 25%, respectively). The average age of the primary family members was 41.45 years. There were no statistically significant differences in the participants' demographics between the two groups at baseline ( $p > .05$ ; Table 1).

### 4.2 | EPDS scores

Figure 2 shows the mean EPDS scores in both groups. At T0, the mean EPDS scores in both groups were similar (7.1 points in the intervention group and 7.0 points in the control group,  $p > .05$ ). At the end of the intervention, the mean EPDS scores in the intervention group decreased over the three time periods at T1, T2 and T3 (5.25, 4.0 and 3.65 points, respectively). Conversely, the mean EPDS scores in the control group increased over the three time periods at T1, T2 and T3 (11.10, 11.90 and 13.05 points, respectively).

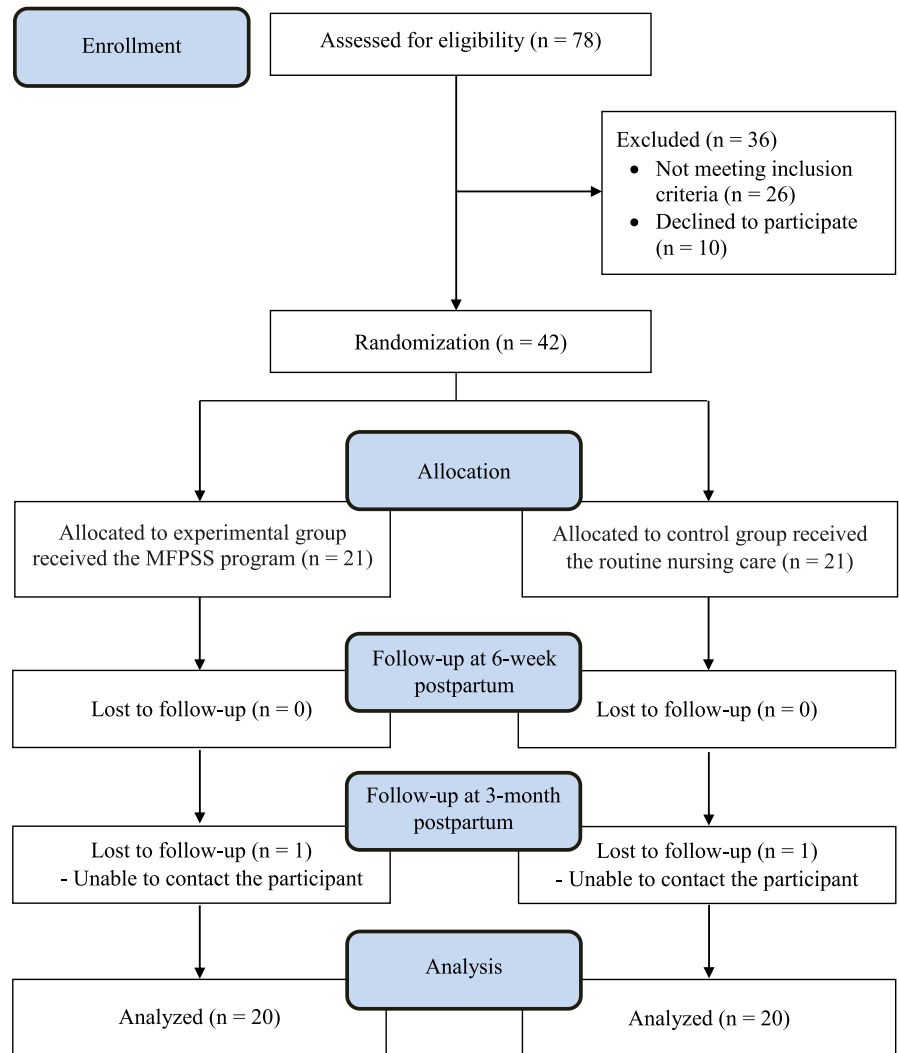
### 4.3 | PPD rates

At T0, none of the adolescent mothers in either of the groups had experienced PPD. At T1, none of the adolescent mothers in the intervention group reported PPD, while one-fourth (25%,  $n = 5/20$ ) in the control group had experienced PPD. During the follow-up period at T2, a few adolescent mothers in the intervention group (5%,  $n = 1/20$ ) and approximately one-third (30%,  $n = 6/20$ ) of the control group had experienced PPD. At the last follow-up (T3), a few adolescent mothers in the intervention group (10%,  $n = 2/20$ ) and nearly-half (40%,  $n = 8/20$ ) in the control group had experienced PPD (Table 2).

### 4.4 | PPD severity

Few adolescent mothers in the intervention group (5%,  $n = 1/20$ ), reported having experienced moderate depression at T2 and T3, while only one adolescent mother (5%) reported having experienced marked depression at T3. In the control group, few adolescent mothers had experienced moderate depression 10% ( $n = 2/20$ ), 15% ( $n = 3/20$ ) and 10% ( $n = 2/20$ ) at T1, T2 and T3, respectively. Marked depression was found to be reported at 10% ( $n = 2/20$ ), 10% ( $n = 2/20$ ) and 15% ( $n = 3/20$ ) at T1, T2 and T3, respectively. Lastly, severe depression was found to be reported at 5% ( $n = 1/20$ ), 5% ( $n = 1/20$ ) and 15% ( $n = 3/20$ ) at T1, T2 and T3, respectively. These findings indicated that, between T1 and T2, most of the depressed adolescent mothers in the control group experienced 'moderate depression' and 'marked depression' (Table 2).

**FIGURE 1** Consolidated Standards of Reporting Trials (CONSORT) flow diagram of the study [Colour figure can be viewed at wileyonlinelibrary.com]



## 4.5 | Effects of the intervention for preventing PPD

### 4.5.1 | Comparison between-group differences on EPDS scores during the four time periods

We compared the effectiveness of the MFPSS programme and routine nursing care in preventing PPD during the four time periods. Mauchly's test of sphericity indicated that the assumption of sphericity was violated (Mauchly's  $W = 0.115$ ,  $p < .001$ ). Therefore, Greenhouse-Geisser correction was used for testing the main effects of time, group and interaction. The results of repeated measures ANOVA revealed that the different times had a significant effect on the mean EPDS scores ( $F(1.476, 56.094) = 3.558$ ,  $p < .05$ ). The results also presented that the different groups had a significant effect on mean EPDS scores ( $F(1, 38) = 36.803$ ,  $p < .001$ ). Moreover, there were also statistically significant interaction effects between time and group (time  $\times$  group) on the EPDS scores ( $F(1.476, 56.094) = 46.335$ ,  $p < .001$ ; Table 3).

Consequently, the simple effect tests, the tests after the significance of interaction effects, were performed to compare the group conditions with each time point. At baseline, there were no statistically significant differences in the mean EPDS scores between the two groups (7.1 vs. 7.0 points,  $F(1, 94.094) = 0.005$ ,  $p > .05$ ). During the data collection process, the mean EPDS scores in the intervention group were statistically and significantly lower than the same scores in the control group over three time periods at T1 (5.25 vs. 11.1 points,  $F(1, 94.094) = 17.923$ ,  $p < .01$ ) and T2 (4.0 vs. 11.9 points,  $F(1, 94.094) = 32.686$ ,  $p < .01$ ) and T3 (3.65 vs. 13.05 points,  $F(1, 94.094) = 46.276$ ,  $p < .01$ ; Figure 2), which represents a large treatment effect size with Cohen's  $d = 1.73$ , 2.1 and 2.3, respectively (Cohen, 1988; Figure 2).

### 4.5.2 | Comparison within-group differences on EPDS scores during the four time periods

During the data collection process, within-group comparison presented that the mean EPDS scores in the intervention group were

TABLE 1 Demographic characteristics of adolescent mothers in the intervention and the control groups (N = 40)

	Intervention group (N = 20)	Control group (N = 20)	t/F/ $\chi^2$	p-value
<b>Adolescent mothers</b>				
Age (year): <i>M</i> ± <i>SD</i>	17.15 ± 1.81	17.675 ± 1.46	-0.960 <sup>a</sup>	.343
Education level: <i>n</i> (%)			5.021 <sup>b</sup>	.252
Primary school	9 (45.0%)	3 (15.0%)		
Junior high school	7 (35.0%)	9 (45.0%)		
Senior high school	4 (20.0%)	8 (40.0%)		
Marital status: <i>n</i> (%)			0.125 <sup>c</sup>	.723
Single	6 (30.0%)	5 (25.0%)		
Partnered	14 (70.0%)	15 (75.0%)		
Planned pregnancy: <i>n</i> (%)			0.440 <sup>c</sup>	.507
Yes	6 (30.0%)	8 (40.0%)		
No	14 (70.0%)	12 (60.0%)		
Number of family members (person): <i>M</i> ± <i>SD</i>	5.45 ± 1.05	5.55 ± 1.19	-0.282 <sup>a</sup>	.780
Living with: <i>n</i> (%)			3.531 <sup>b</sup>	.850
Parents and family members	9 (45.0%)	6 (30.0%)		
Parents, family members and partner	3 (15.0%)	4 (20.0%)		
Partner and partner's family	8 (40.0%)	10 (50.0%)		
<b>Primary family member</b>				
Age (year): <i>M</i> ± <i>SD</i>	39.60 ± 15.94	43.30 ± 11.63	-0.839 <sup>a</sup>	.407
18–30	5 (25.0%)	3 (15.0%)		
31–45	9 (45.0%)	8 (40.0%)		
46–60	4 (20.0%)	8 (40.0%)		
>61	2 (10.0%)	1 (5.0%)		
Relationship with adolescent mother: <i>n</i> (%)			4.225 <sup>b</sup>	.601
Mother	10 (50.0%)	9 (45.0%)		
Partner/father of baby	5 (25.0%)	5 (25.0%)		
Others	5 (25.0%)	6 (30.0%)		
Education level: <i>n</i> (%)			6.361 <sup>b</sup>	.339
Primary school	9 (45.0%)	12 (60.0%)		
Junior high school	5 (25.0%)	2 (10.0%)		
Senior high school	3 (15.0%)	5 (25.0%)		
High vocational certificate	3 (15.0%)	1 (5.0%)		
Marital status: <i>n</i> (%)			1.757 <sup>b</sup>	.679
Single	2 (10.0%)	1 (5.0%)		
Married	12 (60.0%)	15 (75.0%)		
Widowed/divorced/separated	6 (30.0%)	4 (20.0%)		

<sup>a</sup>t-test.<sup>b</sup>Fisher's exact test.<sup>c</sup>Chi-square.

statistically and significantly different across all four time periods at T0, T1, T2 and T3 ( $F(3, 57) = 11.841, p < .01$ ). Consequently, pairwise comparisons were performed to compare each pair of times. The results revealed that the mean EPDS scores in the intervention group at T1, T2 and T3 were statistically and significantly lower than the same scores at T0 ( $p < .05, p < .01$  and  $p < .01$ , respectively; Table 3).

Moreover, the mean EPDS scores in the control group were statistically and significantly different across all four time periods ( $F(3, 57) = 40.777, p < .01$ ). When comparing each pair of times, therefore, the mean EPDS scores in the control group at T1, T2 and T3 were statistically and significantly higher than the same scores at T0 ( $p < .001, p < .001$  and  $p < .001$ , respectively; Table 3).



**TABLE 2** Description of rate and severity of postpartum depression in the adolescent mothers in both groups at baseline, post-test at 4-week postpartum, and follow-up at 6-week postpartum and 3-month postpartum (N = 40)

Variables	Experimental group (n = 20)		Control group (n = 20)	
	n	%	n	%
Baseline (T0)				
Non-depression	20	100.00	20	100.00
Depression	0	0.00	0	0.00
Moderate depression	0	0.00	0	0.00
Marked depression	0	0.00	0	0.00
Severe depression	0	0.00	0	0.00
Post-test (T1)				
Non-depression	20	100.00	15	75.00
Depression	0	0.00	5	25.00
Moderate depression	0	0.00	2	10.00
Marked depression	0	0.00	2	10.00
Severe depression	0	0.00	1	5.00
Follow-up at 6-week postpartum (T2)				
Non-depression	19	95.00	14	70.00
Depression	1	5.00	6	30.00
Moderate depression	1	5.00	3	15.00
Marked depression	0	0.00	2	10.00
Severe depression	0	0.00	1	5.00
Follow-up at 3-month postpartum (T3)				
Non-depression	18	90.00	12	60.00
Depression	2	10.00	8	40.00
Moderate depression	1	5.00	2	10.00
Marked depression	1	5.00	3	15.00
Severe depression	0	0.00	3	15.00

Note: EPDS < 13 score = non-depression; EPDS 13–14 score = moderate depression; EPDS 15–16 score = marked depression; and EPDS > 17 score = severe depression.

Abbreviation: EPDS, Edinburgh Postnatal Depression Scale.

## 5 | DISCUSSION

This study aimed to examine the effectiveness of the MFPSS programme on preventing PPD in first-time adolescent mothers at 4-week, 6-week and 3-month postpartum. In support of our hypotheses, our findings demonstrate that, over a 3-month follow-up, the adolescent mothers in the MFPSS programme had significantly decreased EPDS scores as well as the incidence and severity of PPD when compared with the control group. These findings indicate that the specially-designed 4-week MFPSS programme provided social support by midwives plus family members was an effective intervention for preventing PPD in first-time adolescent mothers. Furthermore, the preventive effects were sustained for up to 3-month postpartum. Thus, the findings can provide data that

potentially leading to an improvement in nursing practice. Moreover, no serious negative effects were identified.

To the best of our knowledge, this is the first randomised trial intervention focused on a psychosocial support intervention combining social support from midwives and family members with the aim of preventing PPD in first-time adolescent mothers. The effectiveness of the MFPSS programme on preventing PPD can be discussed with some possible explanations. First, the informational support was the advice, guidance, suggestions and information relevant to the situation (House, 1981). The adolescent mothers who received the informational support from significant persons such as family members and healthcare professionals received help in coping and managing stressful situations. In the MFPSS programme, therefore, it can be concluded that informational support regarding PPD and social support may enhance understanding about PPD in addition to recognising adolescent mothers' need for social support after childbirth and raising awareness among primary family members about providing social support for adolescent mothers. Therefore, our findings are consistent with several previous studies (Branquinho et al., 2020; Fonseca et al., 2017; Kim et al., 2014), we found that providing the informational support about PPD on the topics of symptoms, risk factors, causes and treatments for mothers by midwives during hospitalisation was an effective method for helping the women identify depressive symptoms and decrease their risks for developing PPD. In addition, providing information about the important role of social support was also an effective method for enhancing social support after childbirth and preventing PPD (Vaezia et al., 2019).

Consequently, the MFPSS programme was able to encourage the adolescent mothers to express their needs for support after childbirth in addition to encouraging the primary family members to address the social support needs of the adolescent mothers. Therefore, our findings of the study presented that more than half of the adolescent mothers (n = 13) told the researcher before participating in the MFPSS programme that they could not tell whether they required social support needs or assistance from others after childbirth. After the intervention, however, the researcher found all of the adolescent mothers (n = 20) to be able to tell whether they required social support needs or assistance from primary family members. Interestingly, the significant types of social support required by the adolescent mothers were instrumental support, particularly in terms of assistance with childcare, meals and household tasks, followed by informational support, emotional support and appraisal support, respectively. The findings of this study were consistent with previous studies that found instrumental support to be the most common type of support required by mothers (Logsdon et al., 2005; Negron et al., 2013).

Third, the MFPSS programme was able to help the adolescent mothers identify their needs and make requests of primary family members, while receiving adequate social support from significant persons can reduce the risks of PPD (O'Neill et al., 2019). In the present study, the adolescent mothers were encouraged to take primary responsibility for the care of their infants. However, family members such as mothers of adolescent mothers or partners/ FOB were also

TABLE 3 Comparison analysis of mean EPDS scores between two groups at four time points (N = 40)

Outcome measure	Time		Within group (time)		Between group (group)		Time × group		T0:T1		T0:T2		T0:T3		T1:T2		T1:T3		T2:T3	
	T0	T1	T2	T3	F	p-value	F	p-value	F	p-value	F	p-value	F	p-value	F	p-value	F	p-value	F	p-value
Intervention group (n = 20)					3.558	p = .048 <sup>a</sup>	36.803	p = .000 <sup>b</sup>	46.335	p = .000 <sup>c</sup>	p = .042 <sup>f</sup>	p = .003 <sup>f</sup>	p = .002 <sup>f</sup>	p = .002 <sup>f</sup>	p = .000 <sup>f</sup>	p = .003 <sup>f</sup>	p = .014 <sup>f</sup>	p = .000 <sup>f</sup>	p = .000 <sup>f</sup>	p = 1.000 <sup>f</sup>
Control group (n = 20)					11.841	p = .001 <sup>d</sup>					p = .000 <sup>f</sup>	p = 0.000 <sup>f</sup>	p = .000 <sup>f</sup>	p = .090 <sup>f</sup>	p = .002 <sup>f</sup>	p = .003 <sup>f</sup>	p = .002 <sup>f</sup>	p = .002 <sup>f</sup>	p = .003 <sup>f</sup>	p = .003 <sup>f</sup>
Effect size <sup>g</sup> (Cohen's d)	0.045	1.73	2.1	2.3																

Note: T0 = baseline; T1 = post-test at 4-week postpartum; T2 = follow-up at 6-week postpartum; T3 = follow-up at 3-month postpartum.

Abbreviation: EPDS, Edinburgh Postnatal Depression Scale.

<sup>a</sup>A repeated measures ANOVA for testing the main effects of time.

<sup>b</sup>A repeated measures ANOVA for testing the main effects of group.

<sup>c</sup>A repeated measures ANOVA for testing the interactions effect (time × group).

<sup>d</sup>A repeated measures ANOVA for testing the simple effects of time in the intervention group.

<sup>e</sup>A repeated measures ANOVA for testing the simple effects of time in the control group.

<sup>f</sup>Pairwise comparisons across four time points in each group.

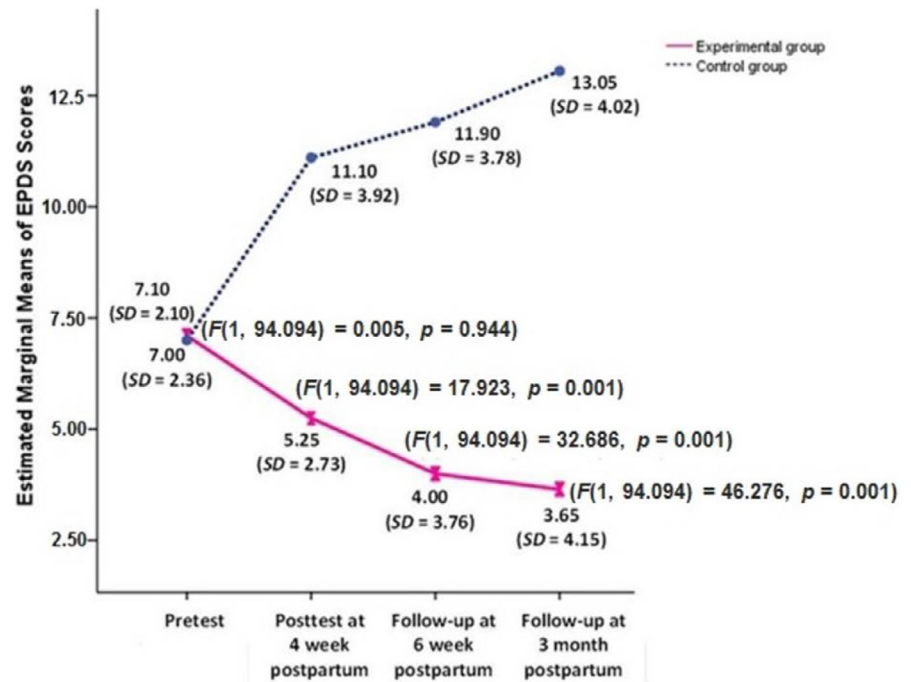
<sup>g</sup>Effect size (Cohen's d) was calculated by subtracting the mean EPDS scores in the experimental group from the mean EPDS scores in the control group and dividing the difference by the pooled standard deviation. Cohen's d > 0.20, 0.50 and 0.80 were considered a small effect, a medium effect and a large effect, respectively (Cohen, 1988).

encouraged to take on the role of primary family member in providing social support, assistance, help and care for the adolescent mothers when they faced difficulties or required any assistance from others. Our findings revealed that the majority of the primary family members who provided social support for the adolescent mothers in both groups were mothers (50% and 45%, respectively). The findings of our study were consistent with several previous studies (Buzi et al., 2015; Hudson et al., 2016; Lee et al., 2020) we found the mothers of adolescent mothers to be significant sources of support for adolescent mothers during pregnancy and after childbirth. Because most adolescent mothers continue to live with their own mothers in the same household during pregnancy and after delivery, they are likely to rely on their mothers for healthcare and financial assistance in addition to requiring emotional assistances (Kagawa et al., 2017; Sriyasak et al., 2016).

Lastly, home visiting after childbirth is a suitable method to obviate the informational and supportive needs of mothers and it would be suitable for providing healthcare services at the convenience of their home. Therefore, home visiting after childbirth by healthcare providers is an effective way for improving social support and decreasing PPD, as well as improving mothers' and infants' health outcomes (McFarlane et al., 2017; Milani et al., 2017). Furthermore, home visits could resolve many challenges for new mothers experiencing many stressful events and serious mental health problems in addition to playing an important part in protecting the risks for developing PPD (Greve et al., 2018; Olds et al., 2019). In the MFPSS programme, home visit and telephone contacts were used to assess the problems of the adolescent mothers' need for support and help after childbirth. During home visit, the researchers encouraged the adolescent mothers to express their needs for social support to their family members and raised awareness among the primary family members as an important person who provides the social support to adolescent mothers under real-living conditions in their homes. Therefore, the adolescent mothers in the MFPSS group could obtain adequate postpartum social support from family members, which prevent PPD in this group. Our findings in the present study are congruent with a previous RCT study that found home visiting interventions could reduce depressive symptoms in adolescent mothers (Barlow et al., 2015).

Conversely, the adolescent mothers in the control group who received only usual nursing care by staff nurses did not receive information about PPD and the significant role of social support, as well as no training about asking for the support needed from others. Consequently, the mean EPDS scores, the rate and severity of PPD in this group increased steadily over 3 months after childbirth (Table 3; Figure 2). Interestingly, the adolescent mothers in the control group had a larger proportion of education in senior high school compared with the intervention group (40% and 20%, respectively). Higher educational level is considered as one of the risk factors of five sub-types of PPD that differed in severity and type of symptoms (Putnam et al., 2017). Therefore, the severity of PPD symptoms in the control group increased throughout the follow-up period, which showed that the depressed adolescent mothers in the control group had more experience with 'marked depression' and 'severe depression' at 3 months

**FIGURE 2** A Comparison of the changes of means EPDS scores from baseline to post-test, and follow-up at 6-week postpartum and 3-month postpartum in the intervention group ( $n = 20$ ) and the control group ( $n = 20$ ). The graph showed a significant interaction effect between-group (treatment) and time point (time  $\times$  group). EPDS, Edinburgh Postnatal Depression Scale [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



after childbirth compared to 6 weeks after childbirth (Table 2). According to the study of Putnam et al. (2017), more than half of depressed women with college educations have more severe anxious depression (sub-type 1) and moderate anxious depression (sub-type 2; 59% and 58%, respectively) compared with those women with high school educations or lower (9% and 14%, respectively).

## 5.1 | Limitations

Although the MFPSS programme in the single-blinded RCT study was presented the significant effectiveness for preventing PPD in first-time adolescent mothers, the study had some limitations which should be cautiously considered when interpreting the results. First, all of the participants in the study were recruited from a single health centre. Thus, the results may not be generalised for the population in different centres. Another limitation was that the majority of the adolescent mothers were first-time mothers who lived in urban areas in Thailand. Generally, urban areas have adequate access to resources for support after childbirth such as support from health centres promoting social support for the participants. Therefore, the effectiveness of the MFPSS programme may be limited in terms of generalisation to other adolescent mothers with different characteristics.

## 5.2 | Recommendations for future research

The recommendations for future research are as follows: First, future studies should be conducted to examine the effectiveness of the MFPSS programme in alleviating PPD symptoms among depressed adolescent mothers. Second, researchers can further evaluate the effects of the MFPSS programme on preventing PPD in other

high-risk groups, such as single adolescent mothers, poverty-stricken adolescent mothers or adolescent mothers without social support, for developing PPD interventions. Third, future researches should be conducted to examine the effects of the MFPSS programme in multiple settings such as rural areas or other regions of the country in order to generalise the findings to various populations. Finally, the instruments for measuring social support such as the multidimensional scale of perceived social support, postpartum social support questionnaire or postpartum support questionnaire should be recommended for future research to explore increases in social support after participating in the MFPSS programme.

## 6 | CONCLUSION

In conclusion, this is the first trial study that focused on educating and encouraging family members to meet the social support needs of adolescent mothers with the aim of preventing PPD. Our findings show that the MFPSS programme was an effective intervention in preventing PPD among first-time adolescent mothers and showed large effect sizes. Moreover, the effects of the MFPSS programme were sustainable until 3-month postpartum, which resulted in a significant reduction in EPDS scores as well as the rates and severity of PPD. Consequently, the MFPSS programme could be considered as a nursing intervention for preventing PPD in adolescent mothers at postpartum units and home visits.

## 7 | RELEVANCE TO CLINICAL PRACTICE

The findings from the study contributed the effective intervention to prevent the development of PPD in first-time adolescent mothers.

The MFPSS programme is a psychosocial support intervention that has a large effect on preventing and alleviating PPD during the postpartum period in adolescent mothers. Furthermore, the programme does not require more financial and human resources, because the programme consists of a single home visit and four telephone contacts. Moreover, the activities in the MFPSS programme were designed based on the duties of nurses in the postpartum unit and could be delivered to adolescent mothers by healthcare providers who are not mental health specialists. Midwives or nurses who provided the programme are not required for specific training to deliver the programme as in other psychological interventions such as cognitive behavioural therapy or interpersonal psychotherapy. Therefore, it may be indicated that the MFPSS programme is inexpensive intervention and a cost ratio of the programme may not differ from the routine nursing care. Midwives or nurses could apply the MFPSS programme to implement in nursing care for adolescent mothers and family members such as mother, father, husband/ partner and other relatives by (a) assessing the PPD symptoms in adolescent mothers after delivery and before discharge from hospital, (b) adding the health information about PPD (e.g. definition, risk factors, impact, prevention and treatment) by verbal instruction combined with handbooks or E-handbook, and (c) promoting the social support together with the routine health information. Importantly, midwives or nurses in postpartum care unit should encourage adolescent mother to ask for the need of social support and encourage the primary family members for adequately providing social support to adolescent mother. Moreover, the public health nurses could apply the MFPSS programme for home visiting of adolescent mothers within the first week of postpartum period to promote the social support in the real home situation.

#### ACKNOWLEDGEMENTS

We would like to thank the adolescent mothers and family members who participated in our study. Special gratitude and appreciation to the Graduate School, Burapha University for supporting grant in conducting this study. Also, special thank Dr. Denchai Laiwattana, M.D. for helpful advice and valuable critique of the manuscript.

#### CONFLICT OF INTEREST

The authors declare that they have no conflict of interests.

#### AUTHOR CONTRIBUTION

B.S.: study design, planning, conduct of study, data collection, data analysis, interpretation of the results and write original manuscript preparation; W.D.: study design, planning, data analysis, interpretation of the results, manuscript review & editing and supervision; P.H.: study design, manuscript review and supervision; N.S.: conduct of study, data collection and manuscript review.

#### ETHICAL APPROVAL

This study was approved by the Institutional Review Committee of the Faculty of Nursing, Burapha University (approval no: 02-11-2561)

and Chonburi Hospital Research Center, Chonburi, Thailand (approval no: 22/62/O/h3).

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

**How to cite this article:** Sangsawang, B., Deoisres, W., Hengudomsab, P., & Sangsawang, N. (2022). Effectiveness of psychosocial support provided by midwives and family on preventing postpartum depression among first-time adolescent mothers at 3-month follow-up: A randomised controlled trial. *Journal of Clinical Nursing*, 31, 689–702. <https://doi.org/10.1111/jocn.15928>