Objectives: To determine the feasibility, acceptability and preliminary effectiveness of the Nurse–Led Social Support Program (NLSS program) to prevent PPD among adolescent mothers. Methods: Out of 27 adolescent mothers assessed for eligibility, a total of 5 adolescent mothers who had Edinburgh Postnatal Depression Scale (EPDS) scores of < 13 points and 5 primary family members were enrolled in the program. The NLSS program is an intervention combining the support from family members of adolescents and midwives. The program consisted of four sessions with home-visit over a period of 4 weeks after childbirth. Feasibility was assessed by considering attendance and drop-out rates, and acceptability by the evaluation form developed by the researchers. PPD was assessed by EPDS with scores > 13 points at baseline, post-intervention (4-weeks postpartum) and follow-up (6-weeks postpartum). Repeated measures ANOVA were used to analyze the data. Results: All participants completely participated in all sessions and activities of the program. They reported the program as helpful and useful in preventing PPD and expressed satisfaction with the program. The EPDS scores decreased over from baseline to post-intervention and follow-up (P-value < 0.001) and each of the 3 pairs of comparison were significance (P-value < 0.05 for all). Conclusions: The findings indicated the NLSS program was feasible, acceptable and effective for preventing PPD in adolescent mothers. A randomized controlled trial with a larger sample size should be conducted. Keywords: adolescent mothers, feasibility study, postpartum depression, prevention, social support

Introduction

Adolescence is the period of transition from childhood to adulthood which is characterized by biological, psychological, and social changes. When an adolescent becomes pregnant, the psychological adjustment of pregnancy is added to the challenges in the transition from adolescence to motherhood.1 Regarding psychosocial problems, adolescents and young mothers may be particularly vulnerable to the psychosocial distress during pregnancy and after childbirth. This is because adolescent mothers face a number of challenges such as a transition to a new maternal role and responsibilities as a mother.2 Moreover, adolescent mothers experience more complicated than adult counterparts during the early period after childbirth.3 Therefore, in terms of psychosocial problems for adolescent mothers in early motherhood, a number of...
studies have suggested that being an adolescent mother may be related to poorer mental health outcomes, such as psychological distress or postpartum depression. Postpartum depression (PPD), a serious mental health issue for many adolescent mothers worldwide, is defined as a major depressive disorder occurring within the first 6 months after delivery. PPD symptoms are similar to those of major depression occurring at other times, including depressed mood, loss of interest or pleasure, guilt feeling, anxiety, irritability, sleep disturbance, disturbed appetite, low energy, fatigue, lack of or excessive concern for the baby, or suicidal ideation. PPD is the most common mood disorder during the postpartum period. The rate of PPD is approximately 10 - 57% in adolescent mothers.

PPD has significant negative consequences, not only on the adolescent mothers experiencing depression, but also on their infants. PPD adversely affects mother-infant interactions, attachment and bonding as well as infant development. Depression in mothers leads to a decreased ability to interpret infant cues and interact with infants. Consequently, depressed mothers are more likely to develop negative relationships with their infants, which may cause the delayed emotional and cognitive development in the infants. Furthermore, depressed mothers are more likely to develop unhealthy behaviors such as excessive alcohol consumption and substance abuse, including cigarettes and illicit drugs.

Lack of or inadequate social support is one of the significant psychosocial risk factors for developing PPD in mothers. Social support is a significant source in providing assistance to all mothers, particularly in adolescent mothers, in terms of improving mental health after childbirth. Additional social support during pregnancy and after childbirth may be needed for adolescent mother. Unfortunately, adolescent mothers often experience lower levels of social support or inadequate social support than non-pregnant peers and adult mothers. Adolescent mothers who lack social support are a high-risk group for PPD. On the other hand, numerous studies have found that adolescent mothers who received high levels of social support were associated with less PPD after childbirth. Therefore, increasing social support, particularly after childbirth, can reduce the development of PPD in adolescent mothers. Moreover, interventions that focus on enhancing social support after childbirth may also be helpful to reduce PPD in adolescent mothers. Social support to adolescent mothers can come from many sources. The support from family members and husband are the most important source for the new mother. In addition to the support from family members, most mothers in early postpartum period felt a need for social support during their transition to motherhood from healthcare professionals such as midwives or nurses. Therefore, several studies and meta-analysis suggested that interventions providing informational support, especially the information about PPD by a healthcare professional immediately after childbirth had shown to be effective in reducing the risk of PPD than providing this information during pregnancy.

Based on the abovementioned findings, the high rate and negative impacts of PPD support the crucial need for developing more effective interventions to prevent PPD. Numerous previous systematic reviews have found that several psychological and psychosocial interventions specifically targeting high-risk mothers for developing PPD are significant methods for preventing PPD in mothers. However, these systematic reviews have focused more on interventions to prevent/treat PPD in adult mothers than adolescent mothers.

Currently, the findings from a recent systematic review of interventions to prevent PPD in adolescent mothers found the majority of psychosocial interventions did not aim at increasing social support. All of the psychosocial interventions were delivered only during the pregnancy, and did not extend to the period after childbirth. Moreover, none of the interventions promoted family members such as mothers, fathers, or husbands/partners in supporting adolescent mothers during pregnancy and the postpartum period. Furthermore, this review did not find any evidence to identify the most effective intervention for preventing PPD in adolescent mothers.

To the best of our knowledge, there are few published studies that focus on developing social support interventions for adolescent mothers to prevent PPD during the postpartum period. In the closest published study, Logsdon et al examined the effectiveness of a social support intervention provided by nurses to 128 pregnant adolescents with 32 - 36 weeks gestation for preventing PPD at six weeks after childbirth. Nurses had a responsibility to deliver the social support intervention to the pregnant adolescents in order to enhance social support and prevent PPD. The social support intervention consisted of three interventions including a pamphlet, a video, or the combination of the pamphlet and the
video. The pamphlet had 15 pages and used 16-point font, with simple drawings and figures next to the text that was culturally sensitive. The voice was active, and the pamphlet was at a sixth-grade reading level. The pamphlet concluded with a summary of key points. The video was 8 minutes long, proceeded at a slow speed, included scene changes, and had both a narrator and dialogue. The pregnant adolescents were randomly assigned to one of the three treatment groups (pamphlet, video, and pamphlet plus video) or the control group. However, the social support intervention was limited to one dimension of social support, namely information support, and did not focus on the other dimensions of support such as instrumental, emotional, and appraisal supports. At the end of the study, the researchers found no difference in PPD scores between the experimental and the control groups at six weeks after childbirth.31

From above mentioned, the social support intervention that combined the support from healthcare provider and family member in early postpartum period can prevent PPD in adolescent mothers. Therefore, we conducted the current pilot study to develop a psychosocial intervention, namely a nurse- led social support program (NLSS program) covering all dimensions of social support in early postpartum period. The NLSS program is an intervention that combines the support from nurses and primary family members of adolescent mothers in the early postpartum period to prevent PPD in adolescent mothers. The results of this study would help prevent PPD in adolescent mothers. Thus, our pilot study aimed to determine the feasibility, acceptability and preliminary effectiveness of the NLSS program designed for preventing PPD in adolescent mothers.

**Methods**

This study used a quasi-experimental, one-group, pretest-posttest and follow-up design with no control group. Data were collected at pre-intervention and 4-week postpartum (post intervention) and 6-week postpartum (follow-up).

The study was approved by the Institutional Review Committee of the Faculty of Nursing, Burapha University (Ref. No.: 02-11-2561) and the Chonburi Hospital Research Center, Chon Buri, Thailand (Ref. No.: 22/62/O/h3).

We recruited adolescent mothers from the postpartum unit of a tertiary hospital between February and April 2019. Adolescent mothers were included in the program if they met the following inclusion criteria: age of 10 - 19 years, first-time mother, normal delivery and hospitalization at the postpartum unit for the first day, scores of < 13 on the Edinburgh Postnatal Depression Scale (EPDS),32 and having a primary family member (husband, mother, father, or grandmother/father) to provide care and social support during the postpartum period. We also included primary family members in the study if they were over 18 years old, and being a primary family member of an adolescent mother such as partner/husband, mother, father, or grandmother/father who was selected by the adolescent mother. The following exclusion criteria were adolescent mothers or infants who had complications after delivery, or adolescent mothers or primary family members who would not be able to participate in all sessions of the NLSS program.

For pilot and feasibility study, a formal sample size calculation may not be appropriate.33 According to Connelly,34 it is suggested that a sample size of pilot study should be 10% of the project sample size. Based on the G*power program version 3.1.9.2,35 an effect size of 0.21 from the previous study31 and an expected drop-out rate of 20%, the sample size in our next RCT study was 42 including 21 participants in each group. Therefore, a minimum sample size in this pilot study was 5.

Of the 23 adolescent mothers assessed for eligibility, 18 of these mothers were excluded; specifically, thirteen did not meet the inclusion criteria and five declined to participate in the study. A total of 5 adolescent mothers with EPDS scores of less than 13 and 5 primary family members were enrolled in the study (Figure 1).

**Intervention and Procedures**

Receiving adequate social support from healthcare professionals and family members, in addition to accurate information, may be able to prevent the risk for developing PPD.28 Therefore, this study developed the NLSS program for preventing PPD in adolescent mothers based on the social support theory,36 related literature describing the social support needed for adolescent mothers after childbirth31 and systematic reviews.30 The NLSS program was designed to cover four dimensions of social support namely informational, emotional, instrumental and appraisal support) and include support from professional nurses and primary family members.
The NLSS program was organized into two phases and consisted of four sessions with six activities conducted over a period of four weeks. The first phase consisted of providing health information, training adolescent mothers to express their need for support after childbirth and training the primary family members of adolescent mothers to provide social support. In phase 2, activities included encouraging adolescent mothers to express their need for support after childbirth and encouraging the primary family members to provide social support. The purposes of the program were to encourage adolescent mothers to express their need for social support after childbirth and to encourage primary family members to provide social support to the adolescent mother. The program was delivered to both adolescent mothers and primary family members at the postpartum unit and the participants' homes from the first day after delivery to the fourth week after delivery.

Briefly, detail of the four sessions was as follows. The first session focused on providing health information about PPD and social support. The researcher delivered PPD and social support information in order to acknowledge adolescent mother for the need of social support after childbirth, and raise awareness of the primary family members of adolescent mother for providing social support to the mother. Adolescent mothers were also taught to detect early PPD symptoms.

In session 2, with the concept of training to ask for help, the activities included training the adolescent mothers to express their need for social support, and training the primary family members to provide social support for adolescent mothers. The researcher spent about 60 - 90 minutes to provide information about the methods to ask for help and to train the adolescent mother to ask for social support from their primary family members. The methods included demonstration, role-play, and feedback. These family members were also trained to provide the social support.

Session 3 was based on the concept of encouraging the adolescent mother to ask for help. Adolescent mothers were encouraged to express their needs for social support necessary and consistent with their own needs under their real living condition after discharge. Similarly, their primary family members were encouraged to provide social support necessary and consistent with the needs of the adolescent mother. In the last session, monitoring and consultation guided the activities. The researcher provided monitoring and consultation via home-visit and telephone contacts. The details of the NLSS program are shown in Table 1. We offered participants US$ 20.00 for completing the 6-week postpartum assessment.

**Usual nursing care**

Usual nursing care was the nursing care that delivered to adolescent mother in the control group and the experimental group during postpartum period by staff nurses. Adolescent mothers received health information about maternal health throughout the early postpartum period. The information provided by staff nurses at postpartum unit included nutrition, medication, breastfeeding, preparation for home infant care, maternal-infant complications, family planning, breastfeeding-skill training, and infant care-skill training (e.g. bathing, shampooing, cord care, and eyes care). After discharge from the hospital, adolescent mothers received postpartum care by staff at the health promoting hospital. During postpartum period until 4 - 6 weeks after delivery, the staff at the health promoting hospital provided cares including telephone contact within 7 days after delivery and home visit at least 2 times.
The theoretical framework of acceptability comprising seven construct components: affective attitude, burden, ethicality, intervention coherence, opportunity costs, perceived effectiveness and self-efficacy. Based on the theoretical framework of acceptability, therefore, the acceptability in this study was assessed by satisfaction which was an affective attitude (i.e., how an individual feels about the intervention), helpfulness and usefulness which was perceived effectiveness (i.e., the intervention was perceived as likely to achieve its purpose). The adolescent mothers and primary family members were asked to complete the evaluation form at the end of the intervention. The evaluation form consisted of three statements reflecting perceptions about the program and assessed the respondents’ level of agreement or disagreement with each statement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher
scores reflected a high level of helpfulness, satisfaction and usefulness from the NLSS program. In addition, we asked the participants the following open-ended questions to guide future modifications of the NLSS program, specifically, “What did you like most about the NLSS program?” and “What did you like least about the NLSS program?”

Postpartum Depression

The Edinburgh Postnatal Depression Scale (EPDS) was specifically developed by Cox et al32 to screen the postpartum depressive symptoms. This tool contains 10-item self-report which was a commonly used screening instrument for the symptoms of perinatal and postpartum depression. The tool was a self-report questionnaire which can be completed in approximately 5 minutes. For each of the 10 items of EPDS, it is rated on a 4-point Likert scale ranging from 0 to 3, with a possible total score of 0 to 30 points, with higher scores indicating greater severity of depressive symptoms. The items included statements relating to feelings of mothers experienced during the previous seven days and evaluated depressed mood, anhedonia, guilt, anxiety and suicidal ideation. Scores of or higher than the recommended cut-off score of 13 were considered having depressive symptoms.32

In this study, the EPDS was used to measure PPD at pre-intervention (within 1 day after delivery), post-intervention (4-weeks postpartum) and follow-up (6-weeks postpartum).

This tool was translated and validated in Thai version by Vacharaporn et al.39 The EPDS Thai version was one of the most frequently used tools to screen postpartum depression in Thai adolescent mothers. Several previous studies about postpartum depression in Thai adolescent mothers found the Cronbach’s alpha coefficients of the EPDS Thai version were 0.81 and 0.87.40,41 Generally, the reliability of the instrument Cronbach’s alpha coefficients of the EPDS Thai version were tested for reliability in this present study. Regarding ethical concern, any adolescent mothers with an EPDS score of 13 or greater at four or six weeks postpartum would be referred to consultation with psychiatric nurses or psychiatrists at the hospital.

Statistical analyses

Descriptive statistics were used to describe personal data and analyze the feasibility and acceptability of the study. Repeated measured ANOVA was used to analyze the differences of the EPDS scores over three time points at baseline, post-intervention at 4-week postpartum and follow-up at 6-week postpartum. Pairwise comparisons were adjusted by using Greenhouse-Geisser correction. Statistical significance was set at a type I error of 5%. Statistical Package for Social Science (SPSS) version 24.0 was used to analyze all data.

Results

The five adolescent mothers who participated in the program aged range from 15 to 19 years (M = 17.0, SD = 1.58). The majority of the adolescent mothers were partnered (60%), had unplanned pregnancies (100%), and were living with their parents and other family members (60%).

The majority of the primary family members who provided social support for the adolescent mothers were mothers (80%), followed by partners or fathers of the baby (20%). These family members were 25 to 43 years old (M = 37.80, SD = 7.33) and were married (80%).

Table 2 Demographic characteristics of the study sample.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent mothers (n = 5)</td>
<td></td>
</tr>
<tr>
<td>Age (years) (Mean ± SD)</td>
<td>17.00 ± 1.58</td>
</tr>
<tr>
<td>Number of family members (person)</td>
<td>5.80</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Junior high school</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Senior high school</td>
<td>3 (60.0%)</td>
</tr>
<tr>
<td>Mental status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>Partner</td>
<td>3 (60.0%)</td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td>5 (100.0%)</td>
</tr>
<tr>
<td>Living with</td>
<td></td>
</tr>
<tr>
<td>Parents and family members</td>
<td>3 (60.0%)</td>
</tr>
<tr>
<td>Parents, family members and partner</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Partner and partner’s family</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Primary family member (n = 5)</td>
<td></td>
</tr>
<tr>
<td>Age (years) (Mean ± SD)</td>
<td>37.80 ± 7.33</td>
</tr>
<tr>
<td>Relationship with adolescent mother</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>4 (80.0%)</td>
</tr>
<tr>
<td>Partner/Father of baby</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Junior high school</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Senior high school</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>High vocational certificate</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Mental status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>4 (80.0%)</td>
</tr>
<tr>
<td>Widowed/Divorced/Separated</td>
<td>1 (20.0%)</td>
</tr>
</tbody>
</table>

Feasibility of the NLSS program

At the end of the study, a total of five adolescent mothers and five primary family members of adolescent mothers in the experimental group completed all four sessions and all six activities of the NLSS program. None of the participants were...
lost to follow-up during the 4-week study. Therefore, the attendance rate was 100.00% and the dropout rate was 0.00% at the end of the study (Figure 1).

Acceptability of the NLSS Program

Adolescent mothers

The total mean score on the evaluation form was 4.47 out of 5 points (range: 3 - 5). When the items were considered individually, the acceptability aspect with the highest mean score was helpfulness of the program (4.60 ± 0.55), followed by the usefulness of (4.40 ± 0.55) and the satisfaction toward (4.40 ± 0.89) the program. Therefore, the high total and individual scores indicated high levels of helpfulness, usefulness and satisfaction with the NLSS program the participants had received.

Based on the open-ended questions about the components of the NLSS program, most adolescent mothers (n = 4 or 80%) indicated that they appreciated the health information about PPD, the training skills in expressing their needs for social support, the home visit and the telephone contacts from the researcher (Table 3). However, more than half of the adolescent mothers (n = 3 or 60%) reported that they were not satisfied with the booklet receiving from the researcher. They would have preferred the booklet in electronic form that could be downloaded via smartphone.

Table 3 Questions and narrative comments related to acceptability of the intervention among the adolescent mothers.

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean Score</th>
<th>Narrative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think the NLSS program would be helpful in preventing PPD in adolescent mothers?</td>
<td>4.60</td>
<td>I felt comfortable when the nurses came to my home. They helped me identify my true needs at home. And they came to assess my problems and needs. They also helped my mom learn how to offer her help consistent with my needs. They taught me about postpartum depression. Currently, there are a lot of women suffering from postpartum depression. The nurses' instruction helped me control and prevented me from experiencing postpartum depression. At first, I hoped I would be able to raise my child by myself, so I did not know about situations where I should call my mom for help. After I had participated in the NLSS program, I learned what my needs were. The program also helped my mom learn how to offer her help.</td>
</tr>
<tr>
<td>Would you recommend the NLSS program to friends or other adolescent mothers?</td>
<td>4.40</td>
<td>I would like to have a mobile version of the booklet. The cartoon and animation of the booklet should be very interesting.</td>
</tr>
<tr>
<td>Were you satisfied with the NLSS program you received?</td>
<td>4.40</td>
<td>The cartoon and animation of the booklet should be very interesting.</td>
</tr>
<tr>
<td>What did you like most about the NLSS program?</td>
<td></td>
<td>The program helped me learn how to provide help and care for my daughter. After I participated in the program, I had more understanding about postpartum depression. It is a serious problem in adolescent mothers.</td>
</tr>
<tr>
<td>What did you like least about the NLSS program?</td>
<td></td>
<td>Hard copy booklets might be inconvenient.</td>
</tr>
</tbody>
</table>

Primary Family Members of Adolescent Mothers

The total mean score on the evaluation form of the primary family members was 4.47 out of 5 points (range: 3 - 5). All three individual aspects of acceptability on the NLSS program, helpfulness, usefulness and satisfaction, were also highly rated (4.40 ± 0.89, 4.40 ± 0.84, and 4.80 ± 0.45 points, respectively).

When the narrative comments in the open-ended questions about the components of the NLSS program were considered individually, most primary family members (n = 4 or 80%) indicated that they appreciated the health information about PPD, the training of primary family members in providing social support for the adolescent mothers, the booklet, and the contacts from the researcher via home visits and the telephone follow-ups (Table 4).

Table 4 Questions and narrative comments related to acceptability of the intervention among the primary family members.

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean Score</th>
<th>Narrative Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think the NLSS program would be helpful in preventing PPD in adolescent mothers?</td>
<td>4.40</td>
<td>The program helped me learn how to provide help and care for my daughter. After I participated in the program, I had more understanding about postpartum depression. It is a serious problem in adolescent mothers.</td>
</tr>
<tr>
<td>Would you recommend the NLSS program to friends or other adolescent mothers?</td>
<td>4.40</td>
<td>Hard copy booklets might be inconvenient.</td>
</tr>
<tr>
<td>Were you satisfied with the NLSS program you received?</td>
<td>4.40</td>
<td>The program helped me learn how to provide help and care for my daughter. After I participated in the program, I had more understanding about postpartum depression. It is a serious problem in adolescent mothers.</td>
</tr>
<tr>
<td>What did you like most about the NLSS program?</td>
<td></td>
<td>Hard copy booklets might be inconvenient.</td>
</tr>
<tr>
<td>What did you like least about the NLSS program?</td>
<td></td>
<td>I felt comfortable when the nurses came to my home. They helped me identify my true needs at home. And they came to assess my problems and needs. They also helped my mom learn how to offer her help consistent with my needs. They taught me about postpartum depression. Currently, there are a lot of women suffering from postpartum depression. The nurses' instruction helped me control and prevented me from experiencing postpartum depression. At first, I hoped I would be able to raise my child by myself, so I did not know about situations where I should call my mom for help. After I had participated in the NLSS program, I learned what my needs were. The program also helped my mom learn how to offer her help.</td>
</tr>
</tbody>
</table>

Postpartum Depression in the Study

After participating in the NLSS program, mean EPDS scores at baseline, post-intervention at 4-week postpartum and follow-up at 6-week postpartum were statistically different (P-value < 0.001) (Figure 2). Therefore, NLSS program could make mean scores of at least two time points to be significantly different. Post hoc comparisons revealed significant differences between pretest and post-intervention, pretest and follow-up at 6-week postpartum, and post-intervention to follow-up at 6-week postpartum (P-value = 0.007, 0.003 and 0.033, respectively). Based on the cut-off of 13 or EPDS, none of the adolescent mothers had PPD at four and six weeks postpartum.

Discussions and Conclusion

The pilot NLSS program was developed for the adolescent mothers who were receiving postpartum care at a large tertiary...
hospital and receiving social support from family members. In this pilot study, the researchers found the NLSS program to be promising as a feasible, acceptable and effective intervention for preventing PPD in adolescent mothers. All of the participants who participated in the NLSS program completed all sessions of the program, and attendance rates were very high. The high attendance rate for the program was similar to other interventions for preventing PPD in adolescent mothers\(^3\) and better than a previously published pilot study.\(^4\)

The NLSS program was highly acceptable to the adolescent mothers and family members. All of the participants reported that the program was more helpful and useful in preventing the development of PPD. Furthermore, the participants were satisfied with the program they had received. However, 60% of the adolescent mothers reported that they were not satisfied with the booklet received from the researcher, stating that they would have preferred the booklet to be in electronic form that could be downloaded by scanning the QR code via smartphone. Therefore, a booklet in electronic form via QR code is required for modification for future studies to attract the interest of the adolescent mothers and prompt them to read it.

The preliminary effectiveness of the NLSS program was demonstrated by the significant decrease in EPDS scores from baseline. The EPDS scores decreased over time points from baseline to post-intervention at 4-week postpartum and follow-up at 6-week postpartum. This could indicate that the NLSS program, comprising of health educational support and home-visit, was effective to prevent PPD in adolescent mothers. The findings are consistent with several previous studies that used health educational support and home-visiting as interventions for preventing PPD in adolescent mothers. Ickovics et al\(^5\) found “high stress” in adolescent mothers who received a prenatal care educational intervention (Centering Pregnancy Plus; CP+) had significantly decreased PPD at one year postpartum. In other studies, Barlow et al\(^6\) found adolescent mothers who participated in the Family Spirit Home-visiting intervention to have lower depressive symptoms compared with a control group at 36 months postpartum. Another study of Ginsburg et al evaluated the feasibility of a depression prevention program for American Indians adolescents and young adults.\(^7\) They developed the “Living in Harmony” (LIH) intervention which was modified from CBT curricula and “Educational-Support program” (ES). Both interventions were delivered to American Indian adolescents by American Indians paraprofessionals. However, the study had no control group. The goal of the intervention was to decrease prenatal depressive symptoms and prevent the onset of major depressive disorder (MDD) in adolescent mothers after childbirth. Adolescents were evaluated for their depressive symptoms during their pregnancy at baseline, at post-intervention, and at 4, 12, and 24 weeks postpartum. At the end of the study, the results showed that the rates of depressive symptoms and MDD were similarly reduced in both groups compared with the scores at baseline. Therefore, the results indicated that the rate of PPD and depressive scores in both groups decreased over time points from baseline to post-intervention and follow-up at 4, 12 and 24 week postpartum.\(^4\) However, the findings of our pilot study are inconsistent with Logsdon et al\(^31\) who found pregnant adolescents in a social support intervention group reported non-significant differences in PPD at six weeks postpartum.

During postpartum period, women have a high demand for health information and social support from family members and health care providers.\(^7\) In the NLSS program, therefore, the informational support about PPD and four dimensions of social support from health professionals could enhance the understanding of PPD and the importance of asking for social support from family members. Similar studies found that providing the information about PPD and social support to mothers and family members at postpartum period, especially during hospitalization immediately after delivery, was an effective method to decrease the risk to develop PPD.\(^27,28,48\)

A recent systematic review of interventions for preventing PPD in adolescent mothers by Sangsawang et al\(^30\) found that
all of the psychosocial interventions were delivered only during the antenatal period and were not extended to the postpartum period. Moreover, health professionals including midwives, nurses, obstetricians and para-professionals were found to be significant persons in directly providing social support interventions for pregnant adolescents. The recent feasibility study for the current research supports these findings. Therefore, unlike the majority of interventions to prevent PPD, this pilot NLSS program was developed and focused on providing social support not only by health care professionals, but also from family members to adolescent mothers. The social support from family members and the husband are the most important sources for the first-time mothers to provide support. Moreover, the mother of an adolescent mother is the most common supporter for providing support and assistance to adolescent mothers during pregnancy and the postpartum period when they face a distress. Many adolescent mothers still lived with their mother after delivery, and they were likely to be dependent on their mother for financial support and newborn care, as well as for emotional support. In addition to the support from mother of the adolescent mother, emotional, esteem, and instrumental, informational, and connection support after childbirth provided by formal support from trusted healthcare providers are also needed. Most mothers in the early period after childbirth felt a need for social support during their transition to the maternal role from healthcare professionals such as midwives and nurses.

Although the NLSS program in the pilot study was found to have significant effectiveness in reducing EPDS scores in adolescent mothers, the results of this pilot study should be interpreted within the context of several limitations. First, the sample size was very small, which limits the generalizability of the results. However, the participants’ characteristics in the NLSS pilot study were similar to those reported in previous larger studies which were conducted in the same population. The majority of the participants were 13 - 19 years old, completed high school, lived and received assistance or support from family members, particularly parents and fathers of their babies. Secondly, the absence of a control group in this study might have interfered with the interpretation of the effectiveness of the program. Therefore, a randomized controlled trial design and enrollment of more participants are required for future studies to examine the effectiveness of the program. Lastly, most of the adolescent mothers in the pilot study lived in urban rather than rural areas. The adolescent mothers who lived in urban areas had adequate access to resources for support during the postpartum period such as support from health centers. These circumstances might have promoted social support for the participants. Therefore, the results may not be generalized to other adolescent mothers living in rural areas.

In conclusion, The NLSS program is one of very few interventions delivered to both adolescent mothers and family members to prevent PPD. All of the participants in the program were highly satisfied and gave positive feedback on the usefulness of the program in assisting them to understand the importance of social support for preventing PPD. The findings of the pilot study indicate that the NLSS program is feasible, acceptable and effective for preventing the development of PPD in adolescent mothers.

Acknowledgements

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References


