Postpartum Depression in Indonesian Mothers: Its Changes and Predicting Factors

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Abstract: Postpartum depression is a serious mental disorder that affects 10%-20% mothers and occurs mostly within the first three months after birth. The purpose of this study was to explore the changes in postpartum depression over three months and to investigate selected predictors including childcare stress, marital satisfaction, self-esteem, life stress, social support, family income, and baby gender preference on changes in depression over three months' postpartum. A prospective longitudinal study was carried out in a sample of 283 mothers at 1, 2 and 3 months postpartum. The participants were recruited by cluster sampling during January – June 2016 from four public health centers in Indonesia. Postpartum depression was assessed using the Indonesian version of the Edinburg Postnatal Depression Scale. Data were collected at home visits. A one-way repeated measure ANOVAand Multilevel Linear Modeling wereperformedfor statistical analysis.

Results showed that the prevalence of postpartum depression was 18.37%, 15.19%, and 26.15% at one, two and three months, respectively. The mean scores using the Scale increased significantly during the first 3 months postpartum. Predicting factors that affected the change in postpartum depression over the 3 months werechildcare stress, marital satisfaction, life stress, and non-acceptance of baby gender. These findings emphasize the need for nurses to screen for maternal depressive symptoms and design intervention programs to alleviate postpartum depression.

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Introduction

Postpartum depression (PPD) is a common and serious mental health disorder for mothers after birth and becomes a community mental health problem.[1] The most common symptoms of PPD are extreme sadness, feelings of hopelessness and inadequacy, being gloomy, inability to feel joy with the baby, severe anxiety, loss of appetite, poor concentration and memory, sleep disturbances, prolonged tiredness, social isolation, and suicidal thoughts.[2] This depression

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can occur as early as 4 weeks after childbirth,[2] however, it begins mostly within the first 3 months after birth.[1,4] The negative impact of PPD may be serious for the woman, her child, and the whole family. Mothers with PPD commonly have parenting impairment[5] and infant sleep and feeding problems occur in children of mothers with PPD within four months postpartum.[6]

The prevalence of PPD ranges from 10% to 20% globally,[1,7,8] however, this prevalence varies across studies depending on factors such as the tools used to measure PPD, the time of measurement, cut-off point scores, and population characteristics.[9] Often the measurement is undertaken at a single time, and is likely to under-estimate the total prevalence of PPD. The period of prevalence ismore accurate if a continuous, or follow-up measurements in the same individuals is possible, and represents the proportion of a population affected by PPD at any time point in postpartum period.[10]

Numerous studies have proposed that some factors contributeas potential causes of PPD[1,4,11] including those physiologic, psychosocial, and baby-related. Previous studies in Indonesia demonstrated risk factors for PPD to include: low incomes and educational background, and being a primigravida;[12,13] newborn low birth weight and prematurity;[13] and lack of social support.[12,14] These studies demonstrated limited research about factors related to PPD overtime among mothers in Indonesia. Hence, there is an urgent need to investigate other potential factors that may put new mothers at an increased risk for PPD, and get a deeper understanding of the established risk factors. New knowledge between some predicting factors and PPD could potentially be useful to assist efforts to optimally prevent this condition.

Conceptual Framework and Review of Literature

The prevalence of PPD in Indonesia is reported to range from 2.5% to 22.3%[12,13] while Asian countries exhibit a range of 3.5% to 63.3%, with Malaysia having the lowest rate, and Pakistan the highest.[14] In the Republic of Indonesia, depression and anxiety affected 14 million ofpeople over 15 years of age or about 6% from total population[15] and PPD is recognized as a significant mental health problem in the country.

Beck's theory of PPD[16] was used in this study as a theoretical framework to examine predictive factors that influence the condition. Beck[16] identified 13 significant predictors of PPD, including prenatal depression, child care stress, life stress, social support, prenatal anxiety, marital satisfaction, history of depression, infant temperament, maternity blues, self-esteem, socioeconomic status, marital status, and unwanted or unplanned pregnancy. Based on Beck's theory,[16] both PPD and some predictive factors, including childcare stress, life stress, marital satisfaction, social support, and self-esteem, had a medium to strong effect size on PPD and are believed to change over time. In other words, the changing of some predicting factors could influence thechange of PPD overtime. Prolonged high levels of childcare stress at 6 weeks to 4 months postpartum are associated with PPD.[6] Some longitudinal studies found that social support was negatively related to PPD within various time point in the first year after birth.[4,17,18] Mothers with low self-esteem and less support from a partner tended to experience PPD in the first and second month after birth.[19] Family income is representative of socioeconomic status, and low family income has a correlation with PPD.[12,14] Although the socioeconomic factor in Beck's theory had a weak correlation with PPD among mothers in western countries, in this study family income was relevant to be investigated in Indonesian mothers. Also, baby gender preference contributes to PPD in several Asian countries,[14] and having a baby girl is highly related to PPD in some Asian countries.[20-22]

Objectives

To investigate the changes in PPD over the first three months postpartum in Indonesia mothers, and examine the influence of selected predictors including

marital satisfaction, self-esteem, life stress, childcare stress, social support, family income, and baby gender preferences on changing PPD over the first 3 months postpartum period.

Methods

Design: A prospective longitudinal study design was used in this study.

Sample and Setting: 322 postpartum mothers were recruited from the maternal and child health clinics of four public health centers (PHCs) in Jakarta and Banten provinces, Indonesia. Jakarta province contains the capital of the Republic of Indonesia and is urban, while Banten province is rural. Both provinces have a high birth rate in Indonesia.[15] The sample size was calculated based on the prevalence of PDD from a previous study[12] and providing for 20% attrition. A sample size of 289 is appropriate for multilevel linear model with seven constructs according to Hair et al.[23] The study sample was selected through one-stage cluster sampling. Four PHCs (clusters) were randomly selected from PHCs in each urban and rural area. Mothers who attended maternal and child health clinics at four selected PHCs and met the following criteria were invited to participate in the study: single pregnancy; having had a vaginal delivery or elective C-section; having no serious complication during pregnancy, labor and postpartum period; able to read, write and speak Bahasa Indonesian; and living with husband. The infant criteria was being full-term (37-42 weeks gestation), having a birth weight gain ≥2500 grams, and healthy. Mothers who were mentally ill or had a family history of psychiatric problems were excluded. Data collection was conducted during January to June 2016 by home visits.

Ethical Considerations: Study approval was obtained from Institutional Review Board (IRB) for Graduate Studies, Faculty of Nursing, Burapha University (No 01-10-2558). Women meeting the inclusion criteria were informed about purpose and processes of the study. They were assured of confidentiality, that participation was voluntary, and they could withdraw from the study at any time. Those agreeing to participate signed an informed consent.

Data collection. Eight instruments were used in this study:

A *demographic informationquestionnaire*, developed by the PI, included mothers' information of maternal age, family income monthly, education background, marital status, planned pregnancy, parity, type of delivery, and religion, and baby information of current gender and birth weight.

The Indonesian version of the *Edinburgh Postnatal Depression Scale* (EPDS) was used to assess PPD. The original English version was developed by Cox et al.[24]and was translated into Bahasa Indonesian by Kusumadewi et al.[25]The EPDS is a 10-item, 4-point rating scale (ranging from 0-3) that asks respondents to rate the intensity of depressive symptoms present during the previous 7 days. The total score of the items range from 0 to 30.Scores of 13 or above are considered as depression[26]. An item example is: *I have been so unhappy that I have had difficulty sleeping*.Cronbach's alpha coefficients of the EPDSin the pilot study of 70 postpartum mothers were .80, and in the present study, .83.

The Dyad Adjustment Scale (DAS) developed by Spanier[27] was used to measure marital satisfaction. The DASconsists of 32-questions with Likert-type items of which numbers 1-22, 25-28 and 32 are scaled from 0-5; 23-24 from 0-4; 29-30 is yes=0, no=1, and item number 31 is scaled from 0 - 6. The possible scores ranged from 0-151 with a cut-off point of <100 which is determined as marital dissatisfaction. An item example is: *Do you ever regret that you married? (or lived together?)*.Cronbach's alpha coefficients of the DAS in the pilot study and in the main study were .73 and .83 respectively.

The Rosenberg's Self-esteem Scale (RSES) developed by Rosenberg[28] was used to measure self-esteem. The RSES-Indonesia version was translated

from the original by Schmitt and Allik.[30] The RSES is a 10-item questionnaire and responses are chosen on a 3-point scale, ranging from strongly agree= 3 tostrongly disagree= 0. Scores are reversed for negative statements. The range of total possible scores is 0-30 and a higher score indicates higher self-esteem. An item example is: *I feel I do not have much to be proud of.* Reliability of the RSES in the pilot study was .79 and in the present study, .71.

The Life Events Questionnaire (LEQ) measures the degree of life stress during prenatal and postpartum periods. The principal investigator (PI) adapted the original 10-item life events questionnaire revised by Norbeck[30] by adding 5-items from the Postpartum Depression Predictors Inventor, revised by Beck.[16] The modified instrument combined the LEQ into the postpartum context. The LEQ-modified contains 15 items with a Likert scale,with a range from 0 (no-effect) to 3 (great-effect). A range of total possible score is 0 – 45 in which a higher score indicates higher life stress. An item example is: *Major change in sleeping habits*. Cronbach's alpha coefficients in the pilot study were .78, and in the present study, .83.

The Childcare Stress Inventory (CSI) was developed by Cutrona[31] and designed to measure stressful postpartum events of parenthood, specifically related to childcare. The CSI contains 20 items and respondents are asked to rate the degree to which they are affected by the aspects above ranging from 0 (not upsetting) to 100 (extremely upsetting). The possible scores range from 0 – 2,000 and a higher score indicates higher childcare stress.An item example is *Can relax with baby*. Cronbach's alpha coefficients in the pilot study were .73, and in the present study, .74.

The Postpartum Support Questionnaire (PSQ) developed by Logsdon et al.[32] was used to assess perception toward receiving supports in the postpartum period. The PSQ contains 34 items, with Likert item ranging from 0 (no help) to 7 (lot of help). The total possible scores range from 0 to 238. A higher score indicates a higher perception receiving support in postpartum period. An item example is: *Needed help in taking care of my baby so that I could take a shower, eat, or have some time to myself.* Cronbach's alpha coefficients in the pilot study were .98, and in the main study, .96.

The *Baby Gender PreferenceQuestiontionnaire* (BGPQ) developed by Kheiderabadi[20] was used to measure desire of current baby gender and acceptance toward this. It consists of two items using a nominal scale for desired of current baby gender (baby boy, baby girl, and no difference) and nominal scale for acceptance toward gender of baby born (0= not accepted, 1 = accepted).

However, the DAS, LEQ-modified, CSI and PSQ had never been used in Indonesian mothers. After getting permission from the developers of instruments, the PI conducted back-translation. First, the original Englishversions of questionnaires were translated to Bahasa Indonesian. Next, bilingual experts from a language center and maternity nursing undertook back-translation from the Indonesian to English, then PI compared two versions of instruments together. Finally, the PI decided to use the best back-translated version. After that, the content validity index (CVI) was undertaken using five experts frommaternal, pediatric and mental health nursing. The CVI of the DAS, LEQ- modified, CSI and PSQ were .95, .85, .82, and .80, respectively.

Postpartum mothers who met criteria in thefour PHCs were invited to take part in this study. If they agreed, the PI-trained research asistants (RAs) asked for phone numbers and addresses of the participants for home visits.The PI and eight RAs conducted data collection concurrently in all study settings. Participants were asked to fill out the questionnaires intheir home without assistance from relatives or neighbours and this took around 30-45 minutes. The PI gave a unique code of each questionnaire for each participant regarding the study site in each time. Each participant filled out all the questionnaires at one, two and three months postpartum except demographic information, family income and desired baby gender, which were

measuredat only 1month assessment. Data collection at the second and the third month included measures of postpartum depression, childcare stress, postpartum support, life stress, self-esteem, marital satisfaction and attitude towards baby gender.

Data analysis. A repeated measure ANOVA and a multilevel linear modeling (MLM) were employed. The participants completed the EPDS at all three assessment periods, meeting one assumption to perform a repeated measures ANOVA. A sphericity test to determine the differences between pairs of scores in all combinations was performed. Sphericity assumption is met when these variances are rougly equal[23]. Using Mauchly's test of sphericity revealed that there were significant differences between the variance of differences (Mauchly's W= 0.396, Chi square = 260.41, df= 2, p value < 0.001).

Four models in MLM were tested. The first model, called the "null model", is for intercept only, estimating the variance in EPDS scores at the first time measurement at within participants (level 1) and between participants (level 2). This model is used as a baseline model for deciding whether the fit of the model to the data improves and variance at level 1 and level 2 drops when adding fixed and random effects of predictors are entered into the model[33]. In model 2, the growth in EPDS scores during the first three months postpartum is modeled. Both fixed and random effects of time are modeled. Model 2 is to test whether the score on EPDS at one month postpartum is related to change of EPDS scores over time.In model 3, the CSI scores, the LEQ scores, the PSQ scores, the DAS scores, the RSE scores, family income and gender preferences are included as level 1 predictors of growth EPDS scores. All predictors are grand mean-centered before they are included in the analysis to aid the interpretation of the results. In model 4, interaction between all predictors in model 3 and time are included in order to test whether interaction all predictors and growth in EPDS scores influenced by the time. A significant difference between two nested models indicates that the model with the lowest value fits better to the data.[33]

Results

From 322 prospective participants, 289 (89.75%) completed questionnaires three times, and 33 (10.25%) were excluded because they did not fill out the questionnaires at second month and/or third month due to moving from their current residence or moving to their home towns. A total of 289 postpartum mothers completed all questionnaires during the first 3 months after birth, and 283 of data were used in the statistical analyses after 6 outliers in the data set were deleted. The mean age of the mothers was 28.89, most were 20 - 35 years old, more than half (54.77%) had graduated from high school, and almost 81% were housewives with a mean of family income was US$250.27 per month. For most mothers, their deliveries were by vaginal delivery (83.39%). Almost one half of the mothers had two children and over one half of the mothers (55.48%) had a baby girl at the current childbirth. (**Table 1**)

Table 1 Demographic characteristics of the sample (N=283)

Characteristics	N	%
Age (Mean = 28 SD= 5.29 Range = 18 - 44) years		
< 20 years	7	2.47
20- 35 years	244	86.22
>35 years	32	11.31
Level of education		
Elementary	22	7.77
Intermediate	50	17.67

Table 1 Demographic characteristics of the sample (N=283) (Continued)

Characteristics	N	%
High school	155	54.77
Diploma	23	8.13
University	33	11.66
Family monthly income (in US$) (Mean = 250.27, SD = 143.88) Range = 37.04 – 814.81		
< 296	156	55.12
≥ 296	127	44.88
Religion		
Islam	273	96.46
Catholic	7	2.47
Protestant	3	1.07
Working status		
Housewife	229	80.92
Employed	54	19.08
Planned pregnancy		
Yes	186	65.72
No	97	34.28
Parity		
1	82	28.98
2	135	47.70
≥ 3	66	23.32
Type of delivery		
Vaginal birth	236	83.39
Elective C-section	47	16.61
Newborn weight (Mean = 3125.85 SD = 367.47 Range = 2500 – 4300) grams		
Current baby's gender		
Boy	126	44.52
Girl	157	55.48

In assessing PPD from the EPDS score, mothers experienced persistent depression (clinical depressive symptoms) of 18.37%, 15.19%, and 26.15% at 1, 2 and 3 months, respectively. EPDS scores at these times ranged. The mean of EPDS score was highest at 3 months postpartum and relating F value for the 'time' factor or within subjects effects was significant (F = 7.27, p-value< 0.01) (**Table 2**). Pairwise comparisons with Bonferroni correction demonstrated that the EPDS scores were significantly higher at three months compared with 1 and 2 months, while there was no significant change in the EPDS scores from 1 to 2 months. A linear change in EPDS scores over time was suggested by these results (**Table 3**).

Table 2 Comparison of PPD mean scoresat 1, 2 and 3 months postpartum(N=283)

Source of variation	SS	df	MS	F	p
Time	99.54	1.25	79.84	7.27	.004
Error	3863.79	351.59	10.99		

Table 3 Pairwise comparisons of PPD mean scores at 1, 2, and 3 months postpartum (N = 283)

Time M(SD)	1 month postpartum	2 months postpartum	3 months postpartum
2 months	-.339		
3 months	-.834*	-.495*	

*p< .05

To investigate the change EPDS scores for PPD over time and its predicting factors, Multilevel Linear Modeling (MLM) was applied. (**Table 4**). Model 1 measured intercept only. The intercept was 8.83, meaning that the initial EPDS score was low score compared to a maximum score of EPDSin initial data (max EPDS score = 19). Fixed effect with an intercept in initial data was significant (p<.001), meaning that initial data in each individual in group was different. In Model 1, the level 1 units were three times the measurement of EPDS, nested within 283 individuals (level 2 units). To examine individual differences in the growth of EPDS scores over time, three random effects were included in model 2 (one for individual variance in intercept, individual variance in the slope for time and covariance between the variance in intercept and the variance in slope for a time). A negative intercept-slope covariance estimate exhibited that mothers with lower EPDS scores at the first month after birth showed lower increasing EPDS scores across the second and third month after birth.

Table 4 Selected predictors on changing EPDS score over the 3months' postpartum period

	Model 1		Model 2		Model 3		Model 4	
	Intercept only		+Change over time in EPDS		+Predictors of the level of EPDS		+Predictors of change over time in EPDS	
	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t	Estimate (SE)	t
Fixed effects								
Intercept	8.83 (0.22)	40.98***	8.42 (0.25)	33.45***	7.58 (0.62)	12.18***	7.73 (77)	10.70***
Time								
Linear (centered at 1 month)			0.42 (0.15)	2.87**	0.34 (0.14)	2.42*	.13 (1.05)	.12
Childcare stress					0.007 (0.007)	6.93***	.01(.001)	5.42***
Social support					-0.003 (-0.003)	-1.17	-.0001 (.58)	-.04
Life stress					0.077 (0.017)	4.56***	.067 (.03)	2.55*
Marital satisfaction					-0.063 (0.011)	-5.44***	-.06 (.02)	-3.759***
Self-esteem					-0.168 (0.031)	-5.47***	-.11 (.05)	-2.13*
Family incomes					-1.108 (-0.008)	-1.20	-1.60 (1.19)	-1.344
Baby gender preferences								
Desired of baby girl					0.443 (0.393)	1.13	.22 (.51)	.43
Desired of baby boy					0.271 (0.395)	.69	.30 (.51)	.58
Attitude toward baby Gender					-0.108 (0.549)	-1.97*	-1.13 (.58)	-1.95
Time Interactions X Predictors								
Childcare stress							-.001 (.001)	-.76
Life stress							.01 (.02)	.39
Social support							-.003 (.002)	-1.37
Marital satisfaction							-.003 (.012)	-.25
Self-esteem							-.56 (.04)	-1.47
Family income							6.17 (7.76)	.80
Baby gender preference								
Desired of baby girl							.21 (.33)	.65
Desired of baby boy							-.03 (.33)	-.10
Acceptance toward baby gender							-.19 (1.02)	.18

Table 4 Selected predictors on changing EPDS score over the 3 months' postpartum period (Continued)

	Estimate of (SE) Covariance	Wald Z	Estimate of (SE) Covariance	Wald Z	Estimate of (SE) Covariance	Wald Z	Estimate of (SE) Covariance	Wald Z
Random effects								
Level 1 (occasions within individuals)	7.00(0.42)	16.82***	1.74 (0.15)	11.90***	1.85 (0.17)	11.17***	1.83 (.16)	11.12***
Level 2 (intercepts between participants)	10.82 (1.12)	9.69***	16.47 (1.51)	10.88***	10.58 (1.06)	9.94***	10.74 (1.10)	9.73***
Random slope for time (variance in change over time)	5.11 (0.51)	10.05***	4.15 (0.56)	-7.12***			4.13 (.44)	9.39***
Covariance intercept and slope for time (**covariance** initial status and change over time)			-4.51 (0.70)	-6.45***	-3.96 (0.44)	9.53***	-4.04 (.59)	-6.89***
Model fit								
R^2 level 1 (occasional level)			75.14%	73.57%			73.86%	
R^2 level 2 (participant level)					2.27%		.7%	
-2 log likelihood (χ^2)	4,551.20		4,307.80		4,118.05		4,112.01	
Akaike's Information Criterion (AIC)	4,555.20		4,315.80		4,148.05		4,160.01	

*p<.05, **p<.01, ***p<.001

a The predictors are mean centered

b Significance of difference from previous model

The inclusion of predictors improved the fit of the model to the data, as demonstrated by the relative large and significant reduction in −2 log likelihood value and Akaike's Information Criterion (AIC) compared to model 1 (-2 log likelihood was reduced to 243.40, and AIC reduced to 239.4). The intercept was found to be significant in both fixed and random effects in model 2. The implication is that there were systematic differences between mothers in their EPDS scores at 1 month postpartum. As the other random effects were significant, this suggests that the fixed effect linear development in EPDS scores over time is quite descriptive for the whole sample, and furthermore, that initial status of EPDS is related to change in EPDS over time. The random slope for time (variance in change over time) was significant ($p < .001$), means that each has a different slope. In total, model 2 could explain 75.14% of the variance in EPDS scores on the occasion level (i.e., within individuals).

In model 3, childcare stress, social support, life stress, marital satisfaction, self-esteem, family incomes, and baby gender preferences were included as predictors inlevel 1. The inclusion of these predictors improved the fit of the model to the data, as demonstrated by the relatively vast and significant reduction in −2 log likelihood value and AIC compared to model 2 (-2 log likelihood was reduced 189.75 and AIC was reduced 167.75). Further, model 3 explained 73.57 % of the variance at level 1 and 2.27 % of the variance at level 2 (i.e., differences in EPDS scores among the participants). The random effect for the slope of time was significant ($p<.001$), meaning that there were systematic individual differences in the change of EPDS scores over time after the effect of the predictors had been controlled. The effects of the predictors demonstrate how the scores of the predictors are related to EPDS scores at the same time of measurement. The results show that high levels scores of childcare stress and life stress had a significant positive relation with EPDS total scores at all points in time ($p< .001$). Mothers with high scores of childcare stress and life stress tended to have high

scores on EPDS at all points in time. Marital satisfaction and self-esteem had a significant negative association with EPDS total scores at all points in time ($p<.001$). Mothers with less marital satisfaction and less self-esteem are likely to have high scores on EPDS in all three months postpartum. Social support ($p=.243$) and family income ($p=.231$) were not significantly predictive to the EPDS score in all three-time points. A non-acceptance toward the baby's gender ($p<.05$) was related to higher EPDS score at all time points, while a desired baby boy or girl was not significant to an increased EPDS score at all time points.

To try to explain the variation in the change in EPDS scores over time, interaction terms between time and the selected predictors in model 4 were constructed but no significant interaction effect was found in all four predictors that had relation to PPD. The inclusion of this interaction effect made the random effect for the slope for time non-significant ($t=0.992$; $p=.321$), but gave only a marginal improvement of the fit of the model to the data (R2-level 2 increased by 0.7 %). The inclusion of this interaction effect made the random effect for the slope of time non-significant (reduced of -2 Log Likelihood = 6.04 compared to model 3), meaning that there were systematic individual differences in change in EPDS scores over time left. Therefore, model 3 and model 4 are not different, and thus model 3 was considered the best model (Table 4)

Discussion

The findings showed that at the third month, 26.15% of participants had EPDS scores of ≥13 indicating them to be at risk of clinical PPD. The EPDS scores increased over time, and a significant change in the mean scores occurred from 1 to 3 months, and from 2 to 3 months, while the mean EPDS scores had no significant change from 1 to 2 months after birth. This finding contrasted with a previous study[17] in that the EPDS scores decreased over six months after birth with significant change in the EPDS mean scores from 6 weeks to 3 months, while mean scores did not change from 3 to 6 months. Analyses showed that the change of the mean EPDS scores over time was predicted by a change in childcare stress, life stress, marital satisfaction, self-esteem and attitude toward baby gender. These findings supported Beck's theory that some predictors are associated with PPD.[16]

Mothers with a higher level of childcare stress exhibited high PPD on all three time points. Childcare stress represents a relatively under-researched risk factor for the development of PPD. This finding is consistent with a previous study[34] which found that infant sleep problems had an association with childcare stress and increased PPD over three months in the postpartum period.[34] Higher childcare stress scores related to infant sleep disturbance and more frequent feeding were associated with PPD, especially if the matters continued as long as four months after birth.[6] The impact of high infant sleep disturbance and frequent feeding on PPD demonstrates that childcare stress proposes an important place in research aimed at the contributions to PPD development. Planning interventions to promote the appropriate programs to alleviate childcare stress in the postpartum period are necessary.

This study also found that mothers with higher life stress showed high EPDS scores on all three-time points. Some life stress during pregnancy and labor may lead to PPD. This finding is consistent with a previous study[35] which found that mental and physical problems during the previous year before childbirth and negative life stress have been associated with PPD among 82% of the mothers who had experienced their recurrent PPD.

As far as marital satisfaction was concerned after childbirth, marital satisfaction emerged as a significant predictor of PPD at all three times points. This finding is consistent with prior studies[36,37] in that mothers with PPD have less marital satisfaction compared to the non PPD mothers during the postpartum period[36, 37] We found that low self-esteem correlated with PPD at all time points, as demonstrated in previous investigations[1,19,36]

and supports an intervention study that aimed to reduce PPD by increasing self-esteem using relaxation and problem-solving group therapy[38].

For social support our study found that social support was not significantly correlated with PPD on all three time points during the first three months after birth. This result did not support Beck's theory.[16] Interestingly, this finding also was not consistent with a prior study where needs for support and perceived available support emerged as significant predictors of PPD in the first six months after birth[18]. Previous studies reported that several dimensions of perceived social support were predictive of the level of PPD[17,18]. The non-significant association of social support to PPD over 3 months after a childbirth might be influenced by Indonesian culture. A traditional postpartum practice in the country is that a woman is valued by their extended family. Particularly within the postpartum period for around 2 months women will live with their mothers or sisters who will take care of them and their baby. Postpartum women will receive support regarding domestic housework and childcare from their family of origin, especially their mothers.

Another finding was that family income did not exhibit association with the change on PPD at all three time points. This study supported Beck's theory that socioeconomic status had a weak correlation with PPD[16]. In contrast, a study found that family income was associated to PPD in the first 6 months after birth.[39] A study in China found that poor status and low income showed a positive and strong association with PPD.[4] A non-significant association between family income in this study may be due to some factors. In national statistics, the average family income in Indonesia is 4,000,000 rupiah per month (around US$296)[40]. The mean of family income in this study was equal to US$ 250 per month, meaning that money might not be a differentiating factor for developing PPD in this sample. Another explanation is about the culture in Indonesia when a woman is giving birth. Families, relatives, friends and neighbors will visit them and carry some gifts or even give money for both mother and newborn baby, and for the first 3 months after birth mothers do not need to pay more for their daily living. In addition, currently family do not need to pay money for delivery because the birth process in Indonesia is covered by government national health insurance.

A desired baby's gender had no association with higher PPD on all time points, while acceptance toward baby gender was associated with PPD at all three time points in the postpartum period. This present study was not consistent with previous studies in some Asian countries,in that delivering a baby girl related to developing PPD[14]. In some Asian cultures, a girl has low status and receives gender discrimination in the community[14]. The preference for boys over girls is still common in India and China[21,22]. In India, mothers who give birth to a baby girl not only have an increased risk for developing PPD, but also for experiencing domestic violence.[37] The reason may be that a girl is considered as a serious burden economic in the family, partly because of the perception that most female adults will marry and thus do not contribute economically to the family. In India, the dowry payments by a female contribute to the stress of the birth of a girl child. Furthermore, acceptance toward a baby's gender had correlation to increased PPD, probably influenced by parental preference toward baby gender. For instance, the mother may be indifferent to the gender of the baby, but a couple or family may have an offspring preference for aboy over a girl. If a newborn is a girl, it can influence mothers' acceptance toward baby gender.

In conclusion, the findings of this study indicated that childcare stress, marital satisfaction, life stress, self-esteem and acceptance toward baby gender are predictive factors of PPD over 3 months postpartum.

Limitations

The present study has some strengths. First, the study used a longitudinal study to explored PPD in the

first 3 months postpartum period. The findings can help us to gain a better understanding of the prevalence of PPD over this period. However, this study has several limitations that should be taken into account when interpreting results. The first limitation comes from the nature of the sample, largely middle-to-lower class sample. The second limitation is the sample bias regarding thetype of delivery (16.61% by elective C-section), which could potentially have influenced the findings.

Implications for Nursing Practice

The findings support the notion that PPD is a maternal mental health problem after birth. Health care providers at PHCs should routinely screen for maternal depression during the first 3 months. Early screening can help identify mothers who are at risk for PPD. Selected predictors including childcare stress, life stress, marital satisfaction, self-esteem and acceptance toward baby gender were associated with PPD at all time points over three months. This suggests that attention needs to be paid to these factors early so as to provide a holistic intervention programs topreventing and reducing PPD. Finally, future studies should have a study period longer than 3 months after birth.

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การเปลี่ยนแปลงของภาวะซึมเศร้าในช่วงสามเดือนภายหลังคลอดและปัจจัยทำนาย ในมารดาอินโดนีเซีย

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บทคัดย่อ: ภาวะซึมเศร้าหลังคลอดเป็นปัญหาสุขภาพจิตที่สำคัญ พบได้ร้อยละ 10-20 ของมารดาหลังคลอดและส่วนใหญ่เกิดขึ้นในช่วงสามเดือนแรกหลังคลอด การศึกษาแบบไปข้างหน้าระยะยาวครั้งนี้มีวัตถุประสงค์เพื่อศึกษาการเปลี่ยนแปลงระดับภาวะซึมเศร้าในช่วงสามเดือนภายหลังคลอดที่วัดด้วยแบบวัดภาวะซึมเศร้าหลังคลอดของ Edinburgh Postnatal Depression Scale และศึกษาปัจจัยทำนายการเปลี่ยนแปลงภาวะซึมเศร้าหลังคลอด ได้แก่ ความเครียดในเลี้ยงบุตร ความพึงพอใจในชีวิตสมรส ความรู้สึกมีคุณค่าในตนเอง ความเครียดในชีวิต การสนับสนุนทางสังคมรายได้ของครอบครัว และตามความต้องการเพศของบุตร กลุ่มตัวอย่างเป็นมารดาหลังคลอด 283 คน ที่มีคุณสมบัติตามที่กำหนดและได้จากการสุ่มแบบกลุ่ม เก็บรวบรวมข้อมูลจากมารดาที่ศูนย์บริการสุขภาพ 4 แห่งใน ประเทศอินโดนีเซีย จำนวน 3 ครั้งคือเมื่อ 1 เดือน 2 เดือน และ 3 เดือนหลังคลอด วิเคราะห์ข้อมูลด้วยการวิเคราะห์ความแปรปรวนทางเดียวแบบวัดซ้ำและการวิเคราะห์โมเดลปัจจัยพหุระดับ ผลวิจัยพบว่า คะแนนภาวะซึมเศร้าเพิ่มขึ้นในแต่ละเดือนอย่างมีนัยสำคัญทางสถิติ โดยเดือนที่3 มีระดับสูงสุดผลการวิเคราะห์โมเดลปัจจัยพหุระดับ พบว่าความเครียดในเลี้ยงบุตรและความเครียดในชีวิตส่งผลทางบวกต่อการเปลี่ยนแปลงภาวะซึมเศร้าหลังคลอดนขณะที่ความพึงพอใจในชีวิตสมรสและความรู้สึกมีคุณค่าในตนเองส่งผลทางลบต่อการเปลี่ยนแปลงภาวะซึมเศร้าหลังคลอดทั้ง 3 ช่วงเวลา และทัศนคติต่อเพศของบุตรส่งผลทางบวกต่อการเปลี่ยนแปลงภาวะซึมเศร้าหลังคลอดผลวิจัยเสนอแนะให้มีการคัดกรองภาวะซึมเศร้าหลังคลอดในมารดาภายในเดือนแรกและให้การดูแลเพื่อลดระดับภาวะซึมเศร้าโดยเน้นแก้ไขปัจจัยที่ทำนาย

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คำสำคัญ : ความเครียดในการเลี้ยงบุตร ความเครียดหลังคลอดบุตร มารดาอินโดนีเซีย ความพึงพอใจในชีวิตสมรสความรู้สึกมีคุณค่าในตนเอง ความเครียดในชีวิต

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