

Postpartum Depression and Its Predicting Factors at One Month after Birth in Indonesian Women

นิพนธ์ต้นฉบับ

Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาอัตราความชุกภาวะซึมเศร้าในช่วง 1 เดือนภายหลังคลอดและประเมินปัจจัยทำนายภาวะซึมเศร้าหลังคลอด ได้แก่ ความเครียดในการเลี้ยงบุตร ความพึงพอใจในชีวิตสมรส ความรู้สึกมีคุณค่าในตนเอง ความเครียดในชีวิต การสนับสนุนทางสังคม รายได้ของครอบครัว และความต้องการชอบของเพศบุตร **วิธีการศึกษา:** การศึกษาเชิงทำนายที่มีกลุ่มตัวอย่างเป็นมารดาหลังคลอด 283 คน ที่มีคุณสมบัติตามที่กำหนด และได้จากการสุ่มแบบกลุ่ม เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูล ประกอบด้วย แบบวัดภาวะซึมเศร้าหลังคลอด Edinburgh (EPDS) แบบประเมินการปรับตัว Dyad แบบสอบถามความรู้สึกมีคุณค่าในตนเอง Rosenberg แบบสอบถามการตัดสินใจชีวิต แบบวัดความเครียดในการเลี้ยงบุตร แบบสอบถามการสนับสนุนหลังคลอด แบบสอบถามความชอบเพศของบุตร ทางสังคม แบบสอบถามทัศนคติต่อเพศของบุตร รวบรวมข้อมูลจากมารดาที่พบบุตรมารับบริการตรวจสุขภาพที่ศูนย์บริการสุขภาพ 4 แห่งในเมืองจาการ์ตา ประเทศอินโดนีเซีย ในช่วงเดือนมกราคม-มีนาคม 2560 วิเคราะห์ข้อมูลด้วยสถิติพรรณนาและการวิเคราะห์ถดถอยพหุคูณ **ผลการศึกษา:** พบว่าร้อยละ 18.37 ของมารดามีภาวะซึมเศร้าความเครียดในเลี้ยงบุตรความพึงพอใจในชีวิตสมรส ความเครียดในชีวิตความรู้สึกมีคุณค่าในตนเอง และทัศนคติต่อเพศของทารกสามารถร่วมกันทำนายภาวะซึมเศร้าหลังคลอดได้ 36.0% ($R^2 = 0.360$, $F = 17.087$, $P < 0.001$) โดยความเครียดในเลี้ยงบุตรมีอิทธิพลมากที่สุด ($\beta = 0.277$, $P < 0.001$) รองลงมาคือ ความเครียดในชีวิต ($\beta = 0.218$, $P < 0.001$) ความพึงพอใจในชีวิตสมรส ($\beta = -0.211$, $P < 0.001$) ความรู้สึกมีคุณค่าในตนเอง ($\beta = -0.138$, $P < 0.05$) และทัศนคติต่อเพศของทารก ($\beta = 0.131$, $P < 0.05$) สรุป: ร้อยละ 18.37 ของมารดาชาวอินโดนีเซียมีภาวะเครียดหลังคลอด และหลายปัจจัยที่ทำนายภาวะซึมเศร้าหลังคลอดในช่วง 1 เดือนหลังคลอดได้ อาจนำผลการศึกษานี้ไปใช้คัดกรองภาวะซึมเศร้าในมารดาหลังคลอดและพัฒนาปฏิบัติการพยาบาลเพื่อลดภาวะซึมเศร้าในมารดาหลังคลอด

คำสำคัญ: ภาวะซึมเศร้าหลังคลอด, ความเครียดในการเลี้ยงบุตรหลังคลอด, ความพึงพอใจในชีวิตสมรส, ความรู้สึกมีคุณค่าในตนเอง, อินโดนีเซีย

Abstract

Objective: This study aimed to describe the prevalence of postpartum depression (PPD) and examine its predictors including childcare stress, marital satisfaction, self-esteem, life stress, social support, family income, and baby gender preference at one month after birth in Indonesia. **Method:** A predictive correlational study was performed with a cluster sampling of 283 postpartum mothers who met criteria. Research instruments included the Edinburgh Postnatal Depression Scale, the Dyad Adjustment Scale, Rosenberg Self-Esteem Scale, the Life Events Questionnaire, Childcare Stress Inventory, the Postpartum Support Questionnaire, and baby gender preference questionnaire. This study was conducted from January 2016 to March 2016 in 4 primary health care centers in Jakarta, Indonesia. Descriptive statistics and a linear regression were performed for data analysis. **Results:** The prevalence of PPD was 18.37%. Childcare stress, marital satisfaction, life stress, self-esteem and attitude toward baby's gender could explain 36.0% of the variance in PPD at one month after birth ($R^2 = 0.360$, $F = 17.087$, $P < 0.001$). Childcare stress explained the most variance in PPD ($\beta = 0.277$, $P < 0.001$), followed by life stress ($\beta = 0.218$, $P < 0.001$), marital satisfaction ($\beta = -0.211$, $P < 0.001$), self-esteem ($\beta = -0.138$, $P < 0.05$), and attitude to not accepted toward baby's gender ($\beta = 0.131$, $P < 0.05$). **Conclusion:** PPD in Indonesian women was 18.37% and could be predicted by various factors. These results could be used to employ a screening for and develop nursing intervention to reduce postpartum depression.

Keywords: postpartum depression, childcare stress, marital satisfaction, self-esteem, Indonesia

Introduction

Postpartum depression (PPD) is the most common serious mental disorders after delivery and becomes one of the considerable public health problems.¹ The most common symptoms of PPD are extreme sadness, feeling of hopeless, inadequate or gloomy, inability to feel joy with the baby, severe anxiety, feeding disorder, deficit attention and memory, sleep disturbance, prolonged tiredness, social

isolation, and suicidal thought.² PPD can occur as early as four weeks after childbirth^{3,4} while postpartum blues can usually be seen around the first to second week postpartum.³ The prevalence of PPD in developing countries is believed to be three times higher than that in developed countries.⁵ The prevalences of PPD for the new mothers after childbirth are more than 10% to 20% worldwide.^{6,7} In

Asian countries, overall prevalence of PPD was 21.8%⁸; while in Indonesia, the prevalence of PPD ranged from 2.23% to 22.3%.⁹⁻¹¹ Regardless of prevalence, the negative impact of PPD is still experienced by many.

PPD can pose deleterious influences on mother, her baby and the whole family. Mothers with PPD commonly have parenting impairment.¹² Parenting impairment, in turn, often results in a difficult child temperament¹³, decreased intellectual and motor development, poor social-emotional development and less secure attachment to the mother.^{14,15}

Several factors may have a significant role in developing PPD. Many studies have proposed that predictors of PPD included social support, stressful life events, marital relationships, pregnancy-related factors, husband/marital relationship, psychosocial factors and infant-related factors^{6,8,16,17}, and baby gender preference.¹⁸⁻²⁰ Based on previous studies, three categories of PPD risk factors included demographic, obstetric and psychosocial factors. Demographic factors consist of age, income, educational background, marital status, working status, and parity.^{9,10} For obstetric related factors, symptoms of complication during delivery and baby size are the major ones of PPD.¹⁰ Regarding psychosocial factor, social support is a significant determiner of PPD.^{9,21} Based on these studies, understanding on the risk factors related to PPD in Indonesian postpartum women is limited. Hence, there is an urgent need to investigate potential factors that may put new mothers at an increased risk for PPD and to gain a deeper understanding of certain established risk factors. The researchers examined some predicting factors of PPD in Indonesia. New knowledge about the relationship between these variables and postpartum depression could potentially be useful in aiming at optimal prevention of PPD. Specifically, the purposes of the study were to identify the prevalence of PPD in Indonesians and examine its predictors including childcare stress, marital satisfaction, self-esteem, life stress, social support, family income, and baby gender preference at one month after birth.

Methods

In this predictive correlational study, we expected to recruit postpartum mothers receiving care at Public Health Centers (PHCs) in South Jakarta District, Jakarta Province and PHCs in South Tangerang District, Banten Province.

These sites represented individuals from both urban and rural areas of Indonesia. Specifically, Jakarta province is the capital of the Republic of Indonesia represented the urban residence; while Banten province is a representative of rural area. Both provinces have the highest birth rate in Indonesia. The study was conducted in four settings namely Kebayoran Lama PHC and Cilandak PHC in South Jakarta district and Pamulang PHC and Ciputat Timur PHC in South Tangerang district. The study was conducted from January to March 2016.

The study population was all Indonesian postpartum mothers who had delivery in the public health centers in the South Jakarta district of Jakarta province and in South Tangerang district of Banten province. The study sample was Indonesian mothers who had delivery and received puerperium physical examinations and/or took their baby for immunizations at the four PHCs. The sample size was based on the formula of $n = Z \cdot \alpha \cdot p \cdot (1-p) / d^2$ where p = estimated prevalence of 0.223 (22.3% from previous study), d = allowable margin of error in estimating prevalence of 0.05, $Z = 1.96$ corresponding to the 2-sided type 1 error of 5%. As a result, a sample of 268 participants was required. In addition, 20% was added to compensate for an attrition of the participants as a minimum requirement. A total of 322 prospective postpartum mothers were expected to be approached for participation. These participants were recruited by a cluster sampling method.

To be eligible, postpartum women had to meet the inclusion criteria as follows. They had to have a vaginal delivery or an elective C-section, no multiple births, no serious complications in pregnancy, labor or postpartum, no mental illness, and no family history of psychiatric problems. They had to give a birth of the full-term baby (37 – 42 weeks of gestational age); have a baby with a weight of $\geq 2,500$ grams, and be healthy; be able to read, write and speak Bahasa Indonesian; and live with their husband.

Instruments

Eight instruments were applied in this study. Demographic information of the participants was collected using the questionnaire developed by the researcher. The participants were asked to provide both the mother and infant information. The mother information included maternal age, monthly family income, educational background, marital status, ethnic group, religion, planned pregnancy, parity, and

type of delivery. On the infant side, the newborn's gender and weight were requested.

PPD was evaluated using the **Edinburgh Postnatal Depression (EPDS) Scale Indonesia Version** translated by Kusumadewi and colleagues (1998)²² from the original the EPDS developed by Cox (1987).²³ The EPDS consists of 10 items, with a Likert-type rating scale of the intensity of depressive symptoms presented during the previous seven days. With a score ranging from 0 to 3 for each item, the possible total score ranged from 0 to 30 with a cut-off of 13 points or more as persistent depression, 10 – 12 as mild depression, less than 10 points as no depression in postpartum women.²⁴ The internal consistency reliability of EPDS was acceptable with Cronbach's alpha coefficients of 0.79 originally²⁵ and 0.80 in this study.

Marital satisfaction was measured by the **Dyad Adjustment Scale (DAS)** developed by Spanier (1976).²⁶ The DAS consists of 32 questions with Likert-type rating scales. The four DAS subscales include dyadic consensus (13 five-point items), dyadic satisfaction (10 five-point items), dyadic cohesion (5 five-point items) and affective expression (4 five-point items). The possible total score of 0 to 151 points could be achieved with a cut-off point of < 100 as having a marital dissatisfaction. Internal consistency reliability of DAS was acceptable to high with Cronbach's alpha coefficients of 0.70 to 0.9527, and 0.73 in this present study.

Self-esteem was measured using the **Rosenberg's Self-esteem Scale (RSES) Indonesia version** translated from the original RSES by Schmitt and Allik (2005).²⁸ The RSES is a 10-item questionnaire with a Likert-type rating scale ranging from 0 (strongly disagree) to 3 (strongly agree). The range of the total possible scores is 0 to 30 where higher scores indicating higher self-esteem level. The RSES has an acceptable internal consistency reliability with a Cronbach's alpha coefficient of 0.7828. In this study a Cronbach's alpha coefficient of 0.79 was found.

The **Life Events Questionnaire (the LEQ)** was used to measure a degree of life stress during prenatal and postpartum periods. The original 10-items life events questionnaire revised by Norbeck (1984)²⁹ were used in this study. However, the researcher added five items from the postpartum depression predictors inventory which were revised by Beck.³ This modified instrument combined the life events questionnaire into postpartum context. We called this

modified questionnaire the LEQ-modified. The questionnaire contained 15 items with Likert-type rating scale ranging from 0 (no effect) to 3 (great effect). The possible total score ranged from 0 to 45 where higher total scores indicated a higher life stress. In this study, the LEQ-modified was tested before use found to have an acceptable internal consistency reliability with a Cronbach's alpha coefficient of 0.78.

Stressful postpartum was measured using the **Childcare Stress Inventory (CSI)** developed by Cutrona (1983).³⁰ CSI was designed to measure stressful postpartum events of parenthood, specifically those related to childcare. With 20 items of CSI, the respondents were asked to rate the degree to which they were affected by the aforementioned aspects from 0 (not upsetting) to 100 (extremely upsetting). The possible total scores range from 0 – 2,000 in which higher scores indicate a higher childcare stress. An acceptable internal consistency reliability was achieved with a Cronbach's alpha coefficient of 0.71.³¹

The **Postpartum Support Questionnaire (PSQ)** developed by Logsdon (1994)³² was used to assess perception toward receiving supports in postpartum period. The PSQ contains 34 items, with a Likert-type rating scale ranging from 0 (no help) to 7 (lot of help). The possible total scores range from 0 to 238. The PSQ's internal consistency reliability was high with Cronbach's alpha coefficients of 0.90 to 0.94 for the total instrument³³ and 0.98 in this present study.

Baby Gender Preference (BGP) Questionnaire developed by Kheiderabadi (2009)³⁴ was used to measure the desire of current baby gender and attitude toward the baby gender. The first item is a nominal scale asking the preference of the current gender either baby boy, baby girl, or no preference. The second item asked the respondent for the attitude toward the baby gender, either not accepting (0) or accepting (1).

The DAS, the LEQ modified, the CSI and the PSQ have never been used in Indonesia mothers. Thus, the researcher conducted a back translation with permission from developers. First, the researcher translated instruments from English to Indonesian language. Next, the bilingual translators specialized in maternity nursing back translated from Indonesian to English. The researcher then compared the original and the back translated versions of each questionnaire. Discrepancies between the two versions were reconciled with revisions as needed. One the last back

translated versions were achieved, the researcher examined content validity of the instruments using content validity index (CVI) using five nurse experts from maternal and pediatric wards and mental health nursing department. Scale level CVIs of the DAS, LEQ, CSI, and PSQ were acceptable with the coefficients of 0.95, 0.85, 0.82 and 0.80, respectively.

Data collection procedure

Data collection was conducted after the Institutional Review Board approval from Faculty of Nursing, Burapha University, and permission from the Office of Health District both in South Jakarta and South Tangerang, Indonesia were obtained. Postpartum mothers in the PHCs of Kebayoran Lama, Cilandak, Pamulang and Ciputat Timur who met the eligibility criteria were invited to take part in this study. Once they agreed to participate, the researcher asked for their phone number and home address for home visit. Data collection was done at the home visit. Each participant filled out all instruments at one month postpartum at their home. Participants were allowed to fill out the questionnaire without disturbance by others. A package of instrument took about 30 – 45 minutes to complete.

Data analysis

Descriptive statistics were used to describe the sample characteristics and the studied variables. A linear regression was performed to determine predicting factors of postpartum depression which included family incomes, childcare stress, life stress, social support, marital satisfaction, self-esteem and baby gender preference. Correlations between study variables, both independent and dependent variables, were tested using the Pearson's product moment correlation coefficients or Spearman's rank correlation coefficient, as appropriate. Difference of depression score (EPDS) among different baby gender preferences was tested by ANOVA. A multiple linear regression was performed to determine the influence of independent variables on the EPDS score. Statistical significance for all tests was set at a type I error of 5%.

Results

Over 3 months of recruitment, 289 of 322 prospective participants (89.75%) completed the questionnaire. After six

outliers in the data set were excluded, data of 283 participants were used in the statistical analysis. More than half of the participants (54.77%) graduated from high school while 11.66% graduated from university (Table 1). The majority were housewives (80.92%). These mothers represented three major ethnic groups including Javanese (40.28%), Betawi (38.87%) and Sundanese (11.66%). More than one half of the mothers (65.72%) had planned pregnancies and for most mothers, their labors were by vaginal delivery (83.39%). Almost half of the mothers (47.70%) had two children, and more than half (55.48%) had a baby girl at the current childbirth. In addition, mothers' age ranged from 18 to 44 (Mean = 28, SD = 5.29). The mean newborn birth weight was 3,125.85 grams (SD = 367.47).

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

Characteristics	N	%
Level of education		
Elementary	22	7.77
Intermediate	50	17.67
High school	155	54.77
Diploma	23	8.13
University	33	11.66
Religion		
Islam	273	96.46
Catholic	7	2.47
Protestant	3	1.07
Working status		
Housewife	229	80.92
Employed	54	19.08
Ethnic group		
Betawi	110	38.87
Sundanese	33	11.66
Javanese	114	40.28
Others	26	9.19
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
Current baby's gender		
Boy	126	44.52
Girl	157	55.48

Description of the study variables

On average, mean family income was 3,378,621 IDR which was equal to 255 US\$ (Table 2). Mean scores of

childcare stress, social support, life stress, marital satisfaction and self-esteem are presented in Table 2.

Table 2 Description of predictor variables of postpartum depression (N = 283).

Variable	Possible score	Actual score	M	SD
Family income (IDR)		500,000 - 11,000,000	3,378,621	1,942,409
Childcare stress	0 - 2,000	0 - 580	116.78	119.17
Social support	0 - 238	10 - 238	133.59	51.92
Life stress	0 - 45	0 - 36	11.20	6.80
Marital Satisfaction	0 - 150	79 - 148	121.40	11.55
Self-esteem	0 - 30	11 - 30	19.38	3.08

In terms of baby gender preference, almost half of the participants (43.5%) reported no difference in the desired baby gender, while 28.6% preferred a baby girl and 27.9% preferred a boy (Table 3). Almost all mothers (92.23%) accepted their baby's gender.

Table 3 Baby gender preferences among postpartum women (N = 283).

Gender preferences	N	%
Desired baby gender		
Boy	79	27.92
Girl	81	28.62
No difference	123	43.46
Attitude toward baby's gender		
Accepted	261	92.23
Not accepted	22	7.77

Prevalence of postpartum depression

Of the 283 mothers, no, mild and persistent postpartum depression were experienced by 59.01%, 22.62% and 18.37%, respectively.

Correlations between predictors of postpartum depression

Childcare stress and life stress were significantly positively related to EPDS scores ($r = 0.450$ and 0.388 , respectively); while marital satisfaction and self-esteem were significantly negatively related to PPD ($r = -0.433$ and -0.237 , respectively (Table 4). However, family income and social support were weakly related to PPD with no statistical significance.

Table 4 Correlations between predictor variables of postpartum depression at one month after birth presented as Pearson's product moment correlation coefficients (N = 283).

Variable	EPDS Score	Family income	Childcare stress	Social support	Marital satisfaction	Life stress	Self-esteem
EPDS score	1	-.016	.450**	.012	-.433**	.388**	-.237**
Family income		1	.123*	.093	-.041	.265**	.058
Childcare stress			1	.034	-.393**	.385**	-.079
Social Support				1	.102	.122*	.051
Marital Satisfaction					1	-.350**	.215**
Life stress						1	-.081
Self-esteem							1

* P -value < 0.05, ** P -value < 0.01.

It was found that the mean scores of EPDS among women who preferred a baby boy, a baby or any gender (8.71, 8.64, and 8.14 points, respectively) were not statistically significant by ANOVA ($F = 0.517$, P -value = 0.597). In addition, PPD as measured by the EPDS was significantly positively correlated with the attitude toward baby gender with a Spearman's rank correlation coefficient of 0.189 (P -value < 0.01).

The results from a linear regression analysis revealed that childcare stress, marital satisfaction, life stress, self-esteem and attitude toward baby's gender explained 36.0% of the variance in postpartum depression at one month after birth ($R^2 = 0.360$, $F = 17.087$, P -value < 0.001). Childcare stress could explain the most variance in PPD ($\beta = 0.277$, P -value < 0.001), followed by life stress ($\beta = 0.218$, P -value < 0.001), marital satisfaction ($\beta = -0.211$, P -value < 0.001), self-esteem ($\beta = -0.138$, P -value < 0.05), and attitude toward baby's gender ($\beta = 0.131$, P -value < 0.05).

Table 5 The prediction of postpartum depression (EPDS score) by various predictors at one month after birth (N = 283).

Predictor	B	SE	β	t
(Constant)	17.728	3.775		4.696**
Family income	0.000	0.000	-0.098	-1.925
Childcare stress	0.010	0.002	0.277	5.036**
Social support	0.001	0.004	0.014	0.277
Life stress	0.142	0.037	0.218	3.841**
Marital satisfaction	-0.080	0.022	-0.211	-3.715**
Self-esteem	-0.198	0.073	-0.138	-2.701**
Baby's gender reference				
Desired baby boy	-0.003	0.539	0.000	-0.006
Desired baby girl	-0.113	0.539	-0.012	-0.209
Attitude toward baby gender	2.155	0.835	0.131	2.580*

Model: Adjusted $R^2 = 0.339$, $F = 17.087$, P -value < 0.001.

* P -value < 0.05, ** P -value < 0.001.

Discussions and Conclusion

The prevalence of persistent PPD in this study was 18.4% at one month after birth. This finding was higher than 2.3% reported by the previous national survey in Indonesia in 2012.¹⁰ The high prevalence of PPD in this study could be attributable to the questionnaire used, or the actual increase in stress postpartum and other factors. Nevertheless, our 18.4% PPD prevalence rate was close to 14.96% from the previous study conducted in 2007 in Surabaya, East Java, Indonesia.⁹ Our finding was also close to prevalence rate found in Asian countries. For example, Rumroangwong et al.⁸ found that 17 – 48% of the mothers experienced PPD in Thailand. In addition, the prevalence of PPD in the first year post-birth was 28.0% in China³⁶, while a 7.5% of PPD was found in India³⁷, which was lower than our study.

Childcare stress was the most significant predictor of PPD in this study. This finding was consistent with previous studies.^{3,6,19,37,38} Mothers in postpartum period experience numerous changes following childbirth. Physical changes include declined estrogen and progesterone hormones. They are subject to adjusting to the responsibility of taking care of the child which is completely dependent on them. In the early postpartum, mothers with baby with sleep disturbance and more feeding during four weeks postpartum had higher scores of child care stress index. If the problem continued up to six months after birth, the PPD was more likely.³⁹ In addition, a research conducted in Thailand found that childcare stress was a predictor of PPD at first month after birth.⁴⁰

As predicted, at one month postpartum, life stress was a predictor of PPD and was significantly positively related to EPDS scores. These findings were consistent with previous studies.^{3,6,8,41} Life stress events including family conflict and sickness of a family member were a predictor of PPD in Oman.⁴² High level of relational stress was the most strongly associated with PPD after adjustment for other stressors. Furthermore, stressful events, such as the death of a significant one, losing relationship or divorce, job change or job loss, moving to different town, cumulative argument with partner, financial problems, and baby sickness are known to cause stress and can trigger PPD. Mother's high stress in postpartum period by experiencing a combination of financial stress⁴³, adverse events in life and high perceived stress⁴⁴ significantly predicted PPD. Beck (2001) stated that

perceived life stress had a moderate relationship with PPD in the early postpartum.³

The present study showed that marital satisfaction was significantly negatively related to EPDS scores and significantly predicted PPD at one month after birth. Mothers who had less marital satisfaction scores were more likely to experience PPD at one month. The finding was consistent with previous studies.³ Having a child is assumed to have a surrounding effect on marital satisfaction and PPD.⁴⁵ A poor quality of married life that could be translated into marital dissatisfaction was known as a factor to aggravate PPD during the postpartum period.⁴⁶

Self-esteem has contributed to PPD at one month after birth where less self-esteem tended to associate with higher scores of EPDS for PPD. This finding was consistent with previous studies.^{6,8,39,45} The stress of negative relationships with partner could also contribute to less self-esteem, which could in turn lead to worsening of PPD.⁴⁶ Instable self-esteem within three months after birth could explain changing in depressive symptoms. In addition, mothers with higher scores of prenatal self-esteem reactivity reported a higher level of PPD.³⁵

Surprisingly social support did not significantly predict PPD at one month postpartum. Interestingly, several previous studies showed the opposite results. Prior studies showed that social support had association to PPD since the first-month postpartum.^{3,6,8,44} The non-significant association at the first month after birth might be influenced by Indonesian culture. In Indonesia, postpartum women are valued by their extended family. Within the 2 months postpartum, the women will be living with their mothers or sisters who take care of the baby and the postpartum women. These women usually receive supports regarding domestic housework and child care from their family of origin, especially from their mothers. Another factor could be the perceived status of the postpartum women where 81% of postpartum women were housewives. These postpartum women are more likely to view their role of housewife to take care of all household chores and the children. They therefore do not perceive these responsibilities as a high level of burden or stress. However, a previous study showed that help and family support available from a spouse/partner were associated with a lower EPDS at 6 weeks postpartum.⁴⁸

The findings showed that family income did not significantly predict PPD at one month after birth. The family income had a slightly negative correlation with PPD. Surprisingly, the average monthly family income was 3.378.621 Indonesia Rupiah (IDR) which was equal to 255 US\$. Therefore, most participants were from family with low to middle socioeconomic status. However, it seemed that a relatively low financial status did not make them suffer from PPD. This present study supported Beck's meta-analysis study that socioeconomic status had a small effect on PPD.³ In contrast, the present study was not consistent with prior studies in Indonesia and China. A study in Surabaya, East Java, Indonesia found that inadequate family income was correlated with PPD at the first six weeks postpartum.⁹ Similarly, Warsiki and colleague (2003)¹¹ revealed that low family income was significantly associated with PPD. Some prior studies also found that low family income exhibited an association with PPD.^{47,48}

Baby's gender preference is classified into three scales specifically desired baby boy, desired baby girl and attitude toward baby's gender. The present study found that neither desire of the baby boy nor desire of the baby girl significantly predicted PPD during the first month after birth. Unacceptance on baby' gender was found to be a predictor of PPD at one month after birth. The present result was probably influenced by parental preference toward baby gender. For instance, mothers might be indifferent regarding the newborn gender, while the spouse or family might prefer a boy over a girl. Therefore, if the newborn was a girl, it could influence the mother's attitude toward baby gender. This study was consistent with previous studies where baby gender preference was associated with PPD.^{19,20,34} Child's gender probably was not initially correlated with the prevalence of PPD but an undesired gender was an important risk factor of PPD with a relatively high risk score.⁴⁸ However, more mothers of boys than of girls had PPD in Sweden; while in Middle East region, having more mothers with girls was not associated with PPD.³⁹ Preference toward baby gender was probably not found to be a risk factor of PPD, but the number of children could be such a crucial factor. It was found that having the first child as a girl was significantly associated with higher EPDS scores.⁴⁹ If the first child was a girl followed by a girl, the EPDS score was significantly higher. On the other hand, if

the first child was a boy and followed by a girl, the EPDS score was not significantly higher.

In terms of implications, the best time for screening PPD in Indonesian mothers is the first month postpartum. Screening at specific points during the first month postpartum may identify the greatest risk of of PPD. Opportunities for screening include the time during hospital stay after birth, the time at the second week health check-up, and the time at 1-month check-up. Most Indonesian mothers have contact with healthcare professionals at these time points. Early detection of high-risk mothers during the early postpartum period may prompt a preventive intervention for PPD. Once detected, mothers with PPD could be referred to appropriate specialists, such as psychologists and/or psychiatrists, in a timely fashion. Screening for PPD by using the EPDS tool can be incorporated into routine postnatal community practice in Indonesia. However, screening for PPD in hospital and community centers in the country are not widely available. Another implication is to identify predicting factors for PPD especially mothers who had problem with baby health, baby gender, nurturing and conflict with family. These could cause higher childcare stress, higher life stress, less marital satisfaction, less self-esteem and unacceptance on baby gender.

The present study has few limitations that should be taken into account when interpreting results. The first limitation of the study was from the nature of the sample. Since most of the participants were from low to middle class, generalization of the results could be limited. The second limitation was the question that had been used to measure baby gender preferences. The researcher used questions with limited answer choices, specifically the desire of current baby gender (baby boy, baby girl, no different), and attitudes toward gender of baby born (not accepted, accepted). These unrefined responses probably could not capture the real preference. The answers could therefore be less accurate.

The future study should explore the impact of PPD on sleep, fatigue, breastfeeding, and general well-being from the early postpartum period across the infant's growth and development. Such study should focus on mothers who have a stressful life event, high child care stress, low self-esteem, less marital satisfaction and unacceptance on baby gender. In addition, further investigation in terms of baby gender preference by using a redefined tool is recommended. An

interventional program to prevent and reduce PPD such as skin-to-skin contact newborn-mother and father, cognitive behavior therapy, interpersonal therapy and support/education group therapy could be tested.

Conclusion

The prevalence of persistent post-partum depression (PPD) in Indonesia was 18.37%. Higher child care stress and life stress during the first-month postpartum related to higher scores of EPDS scores. Less marital satisfaction and less self-esteem were also related to higher EPDS scores. Unacceptance toward baby' gender was correlated with PPD. Child care stress, marital satisfaction, life stress, self-esteem and attitude toward baby's gender were significant predictors of PPD. Childcare stress was the most influential predictor of PPD followed by life stress, marital satisfaction, self-esteem, and attitude toward baby's gender. Thus nursing care should emphasize the arrangement of mothers to undertake baby care as a buffer on childcare stress to eventually enhance the formation of motherhood and decrease PPD. In addition, these several psychosocial risk factors can be used to define a substantial risk of developing PPD.

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Editorial note

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