

Predictors of Postpartum Depression: The Role of Emotion Regulation, Maternal Self-Confidence, and Marital Satisfaction on Postpartum Depression

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Abstract. Postpartum Depression (PPD) is a serious mother's mental health problem that may endanger the safety of mother and her child. This study aimed to identify whether emotion regulation, maternal self-confidence, and marital satisfaction could be a significant predictor of PPD. The participants of this study were 100 women who gave birth in the past 2-24 weeks. Research instruments presented via online platform, comprised of: ASIPP (Alat Asesmen Ibu *Postpartum*/Postpartum Maternal Assessment Tool containing the Emotion Regulation Scale, the Maternal Self-Confidence Scale, and the Marital Satisfaction Scale) and the early detection scale for postpartum depression. Regression analysis showed that only maternal self-confidence and emotional regulation were proven significant in simultaneously predicting PPD, while marital satisfaction was not proven to significantly predict PPD either partially or simultaneously. This finding suggested that psychological prevention programs for postpartum mothers were better focused on encouraging maternal self-confidence and emotion regulation ability of the mothers.

Keywords: emotion regulation; maternal self-confidence; postpartum depression; postpartum depression early detection instrument

Postpartum depression (PPD) is a type of depression experienced by mother after childbirth, which onset occurs on the second to sixth week after giving birth (Gilbert & Harmon, 2003; Departemen Kesehatan RI, 2007). Symptoms experienced include condition of negative affect such as feeling depressed, sad, unworthy or immense guilt; losing interest in nearly any activity; significant weight loss; sleep disturbance; agitation or psychomotoric retardation; trouble in

concentrating; and repeated occurrence of suicidal ideation (American Psychiatric Association, 1994). The global prevalence of PPD in postpartum mothers is known to range between 10-20% (O'Hara & McCabe, 2013; Veisani, Delpisheh, & Sayehmiri, 2013). In Indonesia, the prevalence of postpartum mothers who experience PDD on the first to third month after childbirth ranges between 18-26% (Nurbaeti, Deoisres, Hengudomsuh, 2018). PPD usually starts with mild affective or mood disorder namely postpartum blues or baby blues syndrome which occurs within the

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first week after childbirth but it was not appropriately treated thus developing into more intense mood disorder (Bobak, 2005; Stewart & Vigod, 2016).

PPD experienced by a mother post-childbirth brings negative impacts to the mother herself as well as the baby's future physical-psychological development. A mother with PPD often has reoccurring thoughts of death that can push her to harm herself and/or the baby which can lead to death (Bick, Mac Arthur, Knowles, & Winter, 2001). PPD is also proven to be associated with problems in the baby's physique, underweight, and lack of sleep quality (Gress-Smith, Luecken, Lemery-Chalfant, & Howe, 2012). From the psychological development side, PPD in mothers causes children to experience late development (Ransam & George, 2017; Katon, Russo, & Gavin, 2014), behavioral problems, cognitive development issues and socioemotional development problems such as difficult temperament (Thompson & Fox, 2010; Newland & Parade, 2016). It clearly shows that PPD is a serious mental health problem for mothers and affects the child's development in the long run so it deserves attention.

Study about identification of risk factors or predictors is urgent as an initial preventive effort that is evidence based. Preventive efforts can be done accurately if aimed at predictor of PPD based on research. Klanin and Arthur (2009) found five main domains influencing PPD i.e.; biological, psychological, obstetrics/paediatrics, soci-demographics, and cultural factors. Study by Yim, Stapleton, Guardino, Hahn-Holbrook, and Schetter (2015) discovered that there are two factors

which play role in the onset of PPD, namely biological and psychosocial factors. Research about risk factors or predictors of PPD had actually been done often such as: studies by Gaillard, Le Strat, Mandelbrot, Keïta, and Dubertret (2014); Guintivano, Manuck, and Meltzer-Brody (2018); and Katon et al. (2014).

Various studies showed that there are several variables related to PPD as well as general type of depression; including maternal self-confidence (Haga, Slinning, Kraft, Steen, & Staff, 2012; Leahy-Warren, McCarthy, & Corcoran, 2011; Reck, Noe, Gerstenlauer, & Stehle, 2012; Zubaran, Schumacher, Roxo, & Foresti, 2010), emotion regulation (Compare, Zarbo, Shonin, Van Gordon, & Marconi, 2014; Haga et al., 2012; Visted, Vøllestad, Nielsen, & Schanche, 2018), and marital satisfaction (Abadi, Fallahchai, & Askari, 2014; Nurbaeti, et al., 2018; Maliszewska, Swiatkowska-Freund, Bidzan, & Preis, 2016; Munaf & Siddiqui, 2013; Kiani, Khadivzadeh, Sargolzaee, & Behnam, 2010; Yim et al., 2015). In this study three potential psychological variables indicated to be PPD predictors; namely emotion regulation, maternal self-confidence, and marital satisfaction; were studied. Emotion regulation is related to how someone can regulate and manage emotion, as well as dealing with stressful situations (Gross & Thompson, 2007). The postpartum period is a period depicted as major adaptation process for mothers, both physically and psychologically, especially for the first time mothers and mothers with twins (Choi, Bishai, & Minkovit, 2009; Roshentall, 2003). This condition causes mothers to have emotional problems. The ability to deal with stressful situations

determines whether postpartum mothers can successfully adapt to the transition period by managing emotions that they feel. Kring and Wener (2004) explained that someone who is experiencing depression tends to find difficulty in regulating negative emotions and facing obstacle in choosing effective strategy to solve their problems. According to that finding, researcher is interested in examining if emotion regulation is a good predictor for PPD.

Maternal self-confidence is related to how mother perceives her ability to nurture and understand her children without feeling nervous, anxious, low self-esteem, doubt, and excessively restrained (Lauster, 2006; Russell, 2006). According to Hawes, McGowan, O'Donnell, Tucker, and Vohr (2016), a mother who has negative perception of her ownself and the baby tends to have higher risk of experiencing PPD a month after birth. This shows that a mother with negative maternal perception has potential in experiencing PPD post-childbirth. To examine it, researcher is interested to see how maternal self-confidence can predict PPD.

Poor marriage relationship and lack of support also contribute to the increase of PPD risk (Noorhayati, Nik Hazlina, Asrenee, Wan Emilin, 2015). Marital satisfaction is described by Olson and Olson (2000) as the extent of someone feeling happy and satisfied about various aspects in marriage. In various studies, marital satisfaction is considered as significant predictor for PPD (Odinka et al., 2018; Abadi et al., 2014; Zare et al., 2014). However, study by Yim et al. (2015) showed inconsistent result in predicting PPD. Based on that finding, researchers

are interested in finding out the predictive ability of marital satisfaction to predict PPD, especially if working simultaneously with the two other variables. Hypothesis proposed in this study was emotion regulation, maternal self-confidence, and marital satisfaction can predict PPD.

Method

Research participants

Research participants were 100 women who fulfilled criteria: a) postpartum mother, b) baby's age was 2 to 24 weeks old, c) willing to spare time to fill the questionnaires. The criteria determination of 2 to 24 weeks was based on theoretical concept of PPD which is PPD can emerge starting from the second week post-childbirth. Generally, participants were only selected according to those three criteria. Researchers did not only select participants who had been diagnosed with PPD. The sample size of 100 participants was determined to accommodate the adequate sample size to perform parametric analysis. According to Delice (2010), sample size of 30 to 500 is generally considered adequate for conducting parametric analysis. Researchers also considered the number of participants based on the period of data collection. Demographics data of participants are presented in Table 1.

Participants' involvement in this study was voluntary. Before filling the questionnaire, researchers provided description about the study done and asked for participants' willingness to participate in the study (informed consent) to ensure that participants fully understood their action and no coercion involved.

Table 1.
Data of Participants' Demographics

Age	21–25 years old	31%
	26–30 years old	48%
	31–35 years old	15%
	> 35 years old	1%
	Unknown	5%
Childbirth method	Vaginal	74%
	Caesarian	26%
Number of childbirth	1	75%
	2	22%
	3	3%
Employment status	Working	46%
	Housewife	54%

Research instruments

Instruments used in the study were early detection instrument for postpartum depression (Dinni Difa Postpartum Scale/DDPS) and ASIPP instrument (assessment for postpartum mothers). DDPS is an early detection instrument for PPD and not an instrument for diagnosing. The measurement result showed individual's tendency to experience PPD based on observed symptoms. DDPS was developed with Rasch modeling approach. DDPS consists of 13 items that have good quality (shown by the reliability coefficient of the items which is 0.92) dan overall, DDPS is a qualified instrument (shown by the instrument's reliability coefficient which is 0.9) (Ardiyanti & Dinni, 2018).

ASIPP is an assessment instrument developed by researchers for postpartum mothers. ASIPP consists of three scales: maternal self-confidence scale, emotion regulation scale, and marital satisfaction scale. The three scales were developed with the Rasch modeling approach. The scales have adequate instrument and items' reliability coefficients which are above 0.81. Sumintono and Widhiarso (2014) stated that instruments with item's

reliability coefficient more than 0.81 are classified as reliable instruments. Thus, it can be concluded that the three scales in ASIPP are sufficient. The items selected are qualified items that can unveil psychological attributes that need to be measured (Ardiyanti & Dinni, 2019).

Maternal self-confidence scale was developed according to Lauster's (2006) theory of confidence which was then adjusted to the context of mother's parenting. The scale has 15 items which measures aspects i.e.; ambition, autonomy, optimism, care and tolerance. This scale has instrument's reliability coefficient of 0.82 and item's reliability coefficient of 0.97. The emotion regulation scale was created based on emotion regulation theory by Gross and Thompson (2007). It has 12 items which reveal three aspects namely: ability to manage conscious emotion, ability to control conscious emotions, and ability to handle stressful situation. This scale has instrument's reliability coefficient of 0.82 and the item's reliability coefficient of 0.97.

Marital satisfaction scale was developed by synthesizing marital satisfaction theory by Saxton (1986) and theory by Fowers and Olson (1993). The scale has 27 items which encompasses three aspects namely: material needs, sexual needs, and psychological needs. The scale has instrument's reliability coefficient of 0.91 and the item's reliability coefficient of 0.93. Coefficients of content validity for the three scales were satisfactory, ranged from 0.91-1.

Data collection

Data collection was done online through Google Form at

<http://bit.ly/kesehatanmentalibu> for five weeks, from 1 October to 2 November 2018. Researchers distributed the information and link to the online scales to communities of mothers in social media (Instagram) and WhatsApp groups as well as personal connections. Researchers opted to use this approach with considerations of time efficiency and ease of access (the scales could be accessed anytime and anywhere) so that it reached the participants. Postpartum mothers with infants aged between 2 -24 weeks are very likely busy caring for their infant; thus, by presenting this scale online, postpartum mothers could still participate in the research by filling out the survey from the convenience of their home anytime they have spare time.

Analysis technique

To test the research hypothesis, data were analyzed using regression analysis technique. Prior to the hypothesis testing, research data were analyzed using several assumption tests. It was done to make sure that the prerequisites for parametric analysis (in this case regression analysis) were fulfilled.

Results

Prior to conducting hypothesis testing using regression analysis, researchers did assumption testing first. The results are shown in Table 2.

Linearity test was done with variance comparative analysis for each predictor towards dependent variable. According to the analysis results, it was found that the

three variables were linear. It means that the linearity requirement for research variables was fulfilled. Multicollinearity test was done to see if there was multicollinearity in variables involved in the research. The analysis results showed that VIF for each variable in the research to be more than 1 and less than 10. This showed that there was no multicollinearity for the variables.

Normality test to residual data was done with Kolmogorov-Smirnov Test. According to the analysis result, it was found that the significance value = 0.200 ($\text{sig} > 0.05$) which means that the residuals or errors in the research were distributed normally and thus assumption of residual normality was fulfilled. After assumption tests were done, researchers conducted hypothesis testing using regression analysis. The research hypothesis was "emotion regulation, maternal self-confidence, and marital satisfaction can predict postpartum depression".

Based on regression analysis result (enter method), it was found that the model proposed to predict postpartum depression was proven significant ($F=25.703$, $p < 0.01$). The variables in this model; maternal self-confidence, emotion regulation, and marital satisfaction simultaneously can explain 44,5% varians of postpartum depression (adjusted $R^2 = 0.428$, $R = 0.667$, $\text{sig} < 0.01$). To understand in more detailed manner, the correlation of each independent variable to the dependent variable, further analysis must be done. The results of further analysis is presented in Table 3.

Table 2.
Analysis Results of Assumption Tests

	Variable	Results	Description
Linearity	Maternal Self-Confidence	Sig = 0.094 (sig>0.05)	Linear
	Emotion Regulation	Sig = 0.678 (sig>0.05)	Linear
	Marital Satisfaction	Sig = 0.804 (sig >0.05)	Linear
Multicollinearity	Maternal Self-Confidence	VIF = 1.218	No multicollinearity
	Emotion Regulation	VIF = 1.218	No multicollinearity
	Marital Satisfaction	VIF = 1.187	No multicollinearity
Residual normality		sig = 0.200 (sig>0.05)	

Table 3.
Results of Further Analysis

Model	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta	T	Sig
Maternal Self-Confidence	-0.336	0.159	-0.193	-2.120	0.037
Emotion Regulation	-0.829	0.157	-0.458	-5.299	0.000
Marital Satisfaction	-0.147	0.077	-0.171	-1.905	0.060

In Table 3, it was shown that only emotion regulation and maternal self-confidence that had significant correlation with PPD. It means that emotion regulation and maternal self-confidence can predict PPD; while marital satisfaction was not proven significantly predict PPD. To confirm this finding, regression analysis with stepwise method was done. The analysis results are presented in Table 4.

Using stepwise method, it was confirmed that only emotion regulation and maternal self-confidence that are significantly related to PPD. Thus, emotion regulation and maternal self-confidence can be predictors for PPD. The effective

contribution from maternal confidence and emotion regulation towards postpartum depression is 42.4%.

Analysis results in Table 3 show that there is significant negative relationship between maternal self-confidence and postpartum depression. The higher maternal self-confidence score, the lower PPD score. Then, it was also found negative and significant relationship between emotion regulation and PPD. The higher emotion regulation score, the lower PPD score. Table 3 also shows that there is in fact a correlation between marital satisfaction and PPD but the correlation is not significant ($t = -1.905$, $sig > 0.05$) so marital satisfaction cannot be considered

Table 4.
Summary of Analysis Results (Stepwise Method)

Model	R	R square	R square change	F change	Sig. F Change
1	0.607 ^a	0.369	0.369	57.285	0.000
2	0.652 ^b	0.424	0.056	9.366	0.003

a. Predictor : Constant), REG_EMOSI

b. Predictor : Constant), REG_EMOSI, PD_MATERNAL

as predictor of PPD. Further analysis was then done to understand the correlation of each aspect of marital satisfaction with PPD. From Table 5, it can be seen that material needs has significant correlation with PPD.

Table 5.
Further Analysis of Marital satisfaction (Each Aspect) and PPD

	T	Sig
Material Needs	-2.757	0.007
Sexual Needs	-0.306	0.760
Psychological Needs	-1.435	0.154

To obtain in-depth overview of PPD, researchers analyzed the correlation of participants' demographics data (child-birth method vaginal-caesarian; employment status working-housewife; number of children) with PPD and the results are presented in Table 6. Out of three variables, it was found that only mother's employment that has significant positive correlation with PPD while childbirth method and number of children do not. It shows that no-employment in mothers has significant positive correlation with the prevalence of PPD. In other words, mothers who are not working are more vulnerable to experience PPD compared to working mothers.

Table 6.
Results of Correlation Analysis between Demographics Data and PPD

Demographic Data	PPD	
	r	Sig
Childbirth Method	-0.034	0.739
Employment	0.201	0.045
Number of children	0.076	0.452

Discussion

The research showed that when the three variables were analyzed simultaneously using regression analysis with Enter model, they are considered to be very significant predictors of PPD. However, when further analyzed with Stepwise model regression, it was found that only emotion regulation and maternal self-confidence that showed significant results as PPD's predictors. This indicates that emotion regulation and maternal self-confidence can predict PPD whilst marital satisfaction cannot. Emotion regulation and maternal confidence simultaneously provide 42.4% contribution to PPD which means that the remaining contributions were from other variables and errors.

Referring to Draper and Smith (1998), Enter model regression analysis has lower accuracy rate compared to Stepwise model regression analysis. In Stepwise model, evaluation process is done in several steps by integrating variables one by one into the model. The first variable integrated into the model is the one with the highest correlation and significance values in predicting dependent variable. The next variable entered is a variable with high partial correlation and significance in predicting dependent variable, and so on to a variable with the lowest correlation value. When a new variable is integrated into the model, then the existing variables are evaluated. If there is a variable with insignificant p-value then it will be ousted from the model. This causes Stepwise model regression analysis to be more precise than Enter model which skips these steps.

Results of correlation analysis showed significant negative correlation between emotion regulation and PPD ($t = -5.299$, $sig = 0.000$). Gross and Thompson (2007) divulged that emotion regulation is a series of processes in managing emotion which involve the ability to evaluate and alter emotional reactions to behave according to the present situation. Similar to previous studies by Haga (2011) and Joorman and Gotlib (2010), this study also showed that mother's emotion regulation strategy is strongly related to PPD.

During postpartum period, a mother experiences fluctuation of hormonal state which is known to be responsible in the occurrence of mental health disorder of mother in that period. The change of endocrine system happens drastically starting with the inflation of hormone concentration in the plasm until 40th week of pregnancy and significant decrease in postpartum period. Endocrine hormones involved are estrogene, progesterone, testosterone, corticotropin-releasing hormone (CRH), and cortisol which all follow the plasm's temporal profile. Due to the hormonal fluctuations, a sensitive postpartum mother is prone to experience emotional disorders such as PPD (Schiller, Meltzer-Brody, & Rubinow, 2015; Skalkidou, Hellgren, Comasco, Sylvén, & Poromaa, 2012). However, PPD is not only influenced by biological vulnerability, but also psychosocial one (Yim et al., 2015). Thus, adaptive emotion regulation will help postpartum mother regulating her emotional state, being able to evaluate and alter emotional reactions adequately when facing stress caused by parenting their baby, especially if mother has serious

health condition in postpartum period (Babore et al., 2019).

The key for emotion regulation is cognitive inhibition which is one's ability to block negative materials from staying in working memory (Joorman, 2010). It causes someone to not continuously think about those negative thoughts which can incite negative emotion state. Someone who has depression experiences difficulty to perform cognitive inhibition, so they have problem to access new information which prevents them from finding new adaptive strategy to regulate emotion. According to Joorman and Gotlib (2010), someone with depression has a certain emotion regulation profile: less frequent to use reappraisal strategy and more likely to use rumination and also frequently use suppression strategy. Reappraisal is an emotion regulation strategy which is related to the ability to modify the meaning of an event so that one's emotional response to that situation changes as well (Gross & John, 2003). Someone who has depression finds it difficult to break free from negative perception for an occurrence because the presence of negative cognitive scheme which inhibits them from seeing something positively and causes them to have extreme thinking pattern (Beck, 2001). When a postpartum mother does not use reappraisal adequately in regulating emotion, she will be entrapped in continuous negative emotion because it is difficult to change negative perspective in uncomfortable situation in the process of adapting to parenting a baby. This leads to stress of parenting (Babore et al., 2019).

Rumination is a type of less adaptive emotion regulation which is characterized

by repetitive thoughts regarding individual's attention towards depression symptoms and the implications, causes, and meanings of those symptoms (Joormann & Gotlib, 2010; Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Rumination leads to condition where someone consecutively experiences negative affect, lower positive affect, and stronger cognitive bias (Joorman & Gotlib, 2010). It implies that when postpartum mother experiences depression and frequently uses rumination as emotion regulation strategy, she will face difficulty to escape from unstable emotional condition after childbirth due to continuous fixation on negative thoughts and feelings which prevents her from experiencing happiness. Someone with depression tends to have difficulty to stop ruminating despite wanting to because they understand it will improve their self-realization and sense of being understood (Papageorgiou & Wells, 2001).

Other than those two emotion regulation types, the emotion regulation profile of someone with depression is also characterized by the frequent use of suppression, whether on positive or negative emotion (Joormann & Gotlib, 2010). Suppression is an emotion regulation strategy in which someone prevents the emergence of signals caused by internal and external condition. Emotional suppression is ineffective in reducing negative emotion, instead increasing physiological turmoil and cognitive load (Gross & John, 2003). In the case of postpartum mother, if she tends to use emotional suppression as her emotion regulation, numerous pressures occurring caused by adaptation process after

childbirth and stress in parenting the baby cannot be released adaptively and instead increasing physiological symptoms and mental load.

Maternal self-confidence is also proved to be a significant predictor for PPD in this study. Result of correlation analysis showed that maternal self-confidence has significant negative relation with PPD ($t = -2.120$, $\text{sig} = 0.037$). This is in line with previous studies that showed how maternal self-confidence is negatively correlated with PPD and anxiety disorder (Aydemir & Onan, 2019; Leahy-Warren & McCarthy, 2011; O'Neil, Wilson, Shaw, & Dishion, 2009). Maternal self-confidence is related to how mother perceives her ability in taking care and understanding her children without feeling nervous, anxious, low self-esteem, doubt, and overly bridled (Lauster, 2006; Russell, 2006). When a mother had high maternal self-confidence, she will easily adapt to the tasks of baby parenting and have lower stress level in doing parenting tasks because there is a positive believe in her. It will encourage mother to have sense of control which reduce the appearance of negative emotion (Liu, Chen, Yeh, & Hsieh, 2011).

Maternal self-confidence composed by sufficient mother's knowledge of her parenting tasks, experience, and skills in nurturing baby (Nelson, 2003). Thus, in first-time mother, maternal self-confidence will improve as time goes on which finally help her in dealing with problems in parenting because maternal self-confidence supports the coping ability (Aydemir & Onan, 2019). Generally, maternal self-confidence supports the coping ability within a month post-

childbirth for first-time mothers (Mori et al., 2015). Study by Mirghafourvand and Bagherinia (2017) further showed that maternal self-confidence influences mother's functional status after giving birth. The higher mother's maternal confidence is, mother's functions in running household activities, social and community activities, baby care, and self-care will be formed at faster rate.

Marital satisfaction variable in this study could not significantly predict postpartum depression. Result of regression analysis using stepwise model showed that marital satisfaction was not included in the model. It implies that marital satisfaction is not a predictor that can significantly predict PPD ($t = -1.905$, $sig > 0.05$). Out of three variable studies as predictors of PPD, only variables directly related to individual's internal characteristics which were proven to significantly predict PPD, namely maternal self-confidence and emotion regulation. Previous studies showed inconsistent results about how marital satisfaction can predict PPD (Yim et al., 2015). Most studies showed that marital satisfaction is one of significant predictors for PPD (Miller et al., 2013; Oktaputring, Susandi, & Suroso, 2017; Simpson, Rholes, Campbell, Tran, & Wilson, 2003; Zare et al., 2014). However, the result of this study is aligned with studies that showed that satisfaction towards relationship with partner cannot predict PPD (Feeney, Alexander, Noller, & Hohaus, 2003; Gremigni, Mariani, Marracino, Tranquilli, & Turi, 2011; Grussu & Quatraro, 2009; Mohammad, Gamble, & Creedy, 2011). The extent of how marital satisfaction can predict PPD will differ depending on

cultural context, ethnic, attitude, and lifestyle of study population (Zare et al., 2014).

In this study, if examined in-depth, the aspects of marital satisfaction used encompasses subjective evaluation towards individual's satisfaction in various broad facet namely material needs, sexual needs, and psychological needs of marriage life. According to analysis done by researchers to the aspects of marital satisfaction, it was found that sexual needs ($t = -0.306$, $sig = 0.760$) and psychological needs ($t = -1.435$, $sig = 0.154$) are not related to PPD. Only material needs correlate with PPD ($t = -2.757$, $sig = 0.007$). This caused marital satisfaction was unable to predict PPD in this study.

Sexual needs is an aspect influenced by gender norm. Gender norm demands women to behave more passively compared to men in marriage, particularly in relation to sexual needs fulfillment (Fischer, 2000). This causes items which try to observe the level of marital satisfaction to women based within their sexuality passageway become difficult to response and women seem passive in achieving that satisfaction. It was also confirmed in researchers' study during the instrument development stage using Rasch modeling. It was found that items related to sexual needs fulfillment were difficult to respond by participants. Even, item which involved a statement that wife conveys her sexual needs directly to her husband ("*I can convey my sexual needs to my husband*") became the hardest item to respond by subject (Ardiyanti & Dinni, 2019).

Based on cultural values stated by Hofstede, Indonesia is a country with collectivist cultural character

(Mangundjaya, 2010). Hofstede explained that the characteristics of individualist and collectivist cultures are different in the context of cultural norms, values, and familial duties. In collectivist culture, the source of marital satisfaction is different from individualist culture. Source of marital satisfaction in collectivist society is fulfilling duties to family while in individualist society, achieving hedonistic objectives between husband and wife is the source of marital satisfaction (Hofstede, 2001; Wang, 1994). The two arguments imply that evaluation process of satisfaction of marriage in collectivist society does not put emphasize on fulfillment of hedonistic needs such as sexual needs but more in the fulfillment of familial duties. This also explains why only material needs that could predict PPD in this study. Aligned with Wang's (1994) argument, fulfilling duties to the family such as meeting the material needs is a principal source of satisfaction in marriage for collectivist society. More than that, variables related to social-economic status such as level of economy and family income which are also good predictors for PPD (Dolbier, Rush, Sahadeo, Shaffer, & Thorp, 2013; Goyal, Gay, & Lee, 2010).

For the third aspect, which is the fulfillment of psychological needs, researchers also did not find its significant relationship with PPD. Psychological needs studied in this research encompasses friendship needs, emotional needs, mutual understanding of partner's condition, accepting partner, respecting partner, similar perspective in finding solution, as well as affectionate relationship and warmth between couple. Previous studies revealed that support from partner is one

of the strongest predictors for PPD (Beck, 2001). This implies that fulfillment of psychological needs is a variable that is supposedly related to PPD. However, based on systematic analysis (Yim et al., 2015), satisfaction towards relationship quality with husband does not consistently predict PPD within the first to third month of post-childbirth. Da Costa, Larouche, Dritsa, and Brender (2000) proposed that depression symptom appearing in postpartum period is a prolonged part of PPD symptoms that should be differentiated from depression symptom that only occurs in postpartum period. Factors related to hormonal influences are assumed to be more dominant compared to psychosocial factors in depression symptoms which occur in postpartum period, within the first months. Because of that, the characters of study participant whose postpartum periods vary from 0 to 6 months could be a factor that affected why psychological needs fulfillment was not related to PPD.

Further analysis towards demographic variables which are childbirth method, mother's employment, and number of children also showed varied results in relation to PPD. Out of three variables only mother's employment that showed significant relationship with PPD. Mother's non-employment was found to be significantly correlated with PPD ($r=0.201$, $sig=0.45$). Aligned with previous finding, mothers who experience PPD are mostly non-working mothers or housewives and mothers with part-time type of employment compared to full-time working mothers (Bener, Burgut, Ghuloum, & Sheikh, 2012; Ho, Chang, & Wan, 2013). It is because in postpartum period, financial

issue is a factor that affects the onset of PPD (Bener et al., 2012). When a mother has her own income, there is financial freedom which makes her economically empowered. Moreover, previous study showed that there is a significant relationship between economy hardship and symptoms of depression in postpartum period (Ongeri et al., 2018).

Childbirth method ($r=-0.034$, $\text{sig}=0.739$) was found to not have significant correlation with PPD. In several studies, C-section childbirth method correlates with high prevalence of PPD. It is due to immense pain that inhibits mother's physical activities and medical complication after surgery (Al Nasr et al., 2020). However, the result of present study is aligned with study by Ongeri et al. (2018) which found that childbirth method is not significantly related to PPD. The reason for such result is because childbirth method is not directly correlated with PPD. Physical inhibition and the presence of pain post-childbirth will not cause mother to develop PPD immediately if there is enough support from husband and family. This argument is aligned with the result of systematic review done by Yim et al. (2015) which revealed that support from husband and family plays an important role in predicting PPD. Moreover, mother's preference factor during antepartum period also influences relationship between childbirth and PPD. Mother who has strong preference to do vaginal childbirth and ends up giving birth through C-section is vulnerable to experience PPD in the beginning of postpartum period (Houston et al., 2015).

The number of children in this study was not found to be significantly related to

PPD ($r=0.076$, $\text{sig}=0.452$). The finding is similar to study by Milgrom et al. (2008) in their analysis of demographic variables, which showed that having one or two children is not significantly related to PPD. However, that study found that having more than two children is significantly correlated with PPD. It indicates that the number of children is also related to other factors influencing PPD. Researchers propose that one of those factors is economy adversity caused by having more children. As the result stated, factor related to economy adversity is significantly related to PPD. Moreover, the child's status was also found to be related with PPD. A mother who gives birth in a condition of unwanted pregnancy has higher risk to develop PPD compared to the one who is expecting pregnancy (Brito, Alves, Ludemir, Araujo, 2015).

The participants of this study were obtained by distributing questionnaire through online platform and without mapping the mothers' social-economic status (SES) specifically. The online data collection method caused this study to have limited population characteristics, i.e. good SES. Sample data from participants with low SES were therefore under-represented. Whereas, SES affects the risk of someone experiencing PPD. Woman with lower SES (e.g.; low income, unmarried, and unemployed) is 11 times at higher risk to develop PPD (Goyal et al., 2010). Thus, the next study should consider not only online data collection but also combined with other data collection methods (directly) to reach out to participants with low SES. Also, future study should specifically map the

participants' SES and examine how it related to PPD in Indonesia.

Further study about PPD showed that PPD can also happen in father or also called as paternal postpartum depression, and in fact the level of father's PPD directly comorbid with mother's PPD (Kim & Swain, 2007). Kim and Swain (2007) also explained that paternal PPD negatively impact the family condition such as increased emotion and behavior problems in children as well as increased conflicts in marriage. In Indonesia, research related to paternal PPD is still difficult to find, especially in correlation with maternal PPD even though understanding about paternal PPD in Indonesian society is very important because it contributes to Indonesian families' well-being. Based on this, researchers suggest that future studies can consider about further examining paternal PPD and including the data to understand maternal PPD.

The result of this study implies that there needs to be prevention programs for pregnant mothers that aim to increase emotion regulation competence and maternal self-confidence in doing parenting tasks to prevent the occurrence of postpartum depression after giving birth. The programs related to mother's internal capacity in dealing with postpartum period and baby caring will contribute more to protect mother from PPD.

Conclusion

Maternal self-confidence and emotion regulation were proven to be predictors of postpartum depression, while marital

satisfaction cannot predict postpartum depression. From three variables analyzed as predictors of postpartum depression, only variables related to individual's internal characteristics which were proven to predict postpartum depression namely maternal self-confidence and emotion regulation which provided 42.4% effective contribution. The study results imply that there needs to be prevention programs for pregnant mothers which aim to improve mother's capacity in facing postpartum period and caring for her baby. This prevention program needs to target the improvement of adaptive emotion regulation ability such as ability to do reappraisal and improvement of mother's confidence in performing parenting tasks.

Suggestion

Future studies need to consider not to only collect data online but also combining direct data collection method to reach out to participants with lower SES so that specific SES data could be mapped and analyzed for its relation with PPD in Indonesia. The next researchers can also consider to study paternal PPD and how it correlates with maternal PPD, even exploring the variable within the context of Indonesian society because research about paternal PPD has not been done much in Indonesia. The study results showed the importance of preventive programs directed for pregnant mothers to deal with postpartum period. For practitioners, it is important to organize educational program aiming to improve postpartum mother's emotion regulation. Also, the program needs to be accompanied by another program which focuses on increasing mother's confidence in doing her parenting tasks, e.g., equipping

mother with knowledge and skills in taking care and nurturing baby so that the risk of PPD can be minimized.

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Author's contribution

The first author is responsible for research design, management, instrument gathering, data collection, manuscript production and manuscript revision. The second author is responsible for instrument gathering, data analysis, data collection, manuscript production and manuscript revision.

Conflict of interests

The authors declare there is no conflict of interest in this research..

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