ORIGINAL RESEARCH

Postpartum Depression and Its Contributing Factors among Mothers during the COVID-19 Pandemic in North Jakarta, Indonesia

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Article Info	Abstract
  Corresponding Author: Irma Nurbaeti Faculty of Health Sciences, Universitas Islam Negeri Syarif Hidayatullah Jakarta, Indonesia Email: irma.nurbaeti@uinjkt.ac.id	**Background:** Postpartum depression is a common psychological problem that occurs after birth. It has become especially prevalent in the era of the COVID-19 pandemic. Several factors contribute to postpartum depression. However, a limited study evaluated factors contributing postpartum depression among mothers during the COVID-19 pandemic, particularly in Indonesia. **Purpose:** This study aimed to explore postpartum depression among mothers and its contributing factors during the COVID-19 pandemic. **Methods:** This study adopted a cross-sectional design. A total of 110 postpartum mothers were recruited by accidental sampling with the following inclusion criteria: mothers between one month and one year after birth, married, a singleton birth and the baby alive, and the mother is healthy with no complications. The Edinburgh Postnatal Depression Scale was used to measure postpartum depression. Descriptive statistics, t-test, Fisher exact test, one-way ANOVA, and logistic regression were performed to analyze the data. **Results:** The prevalence of postpartum depression during the pandemic period was 31.82%. Factors contributing to postpartum depression were the mother's age (p=0.011), childcare stress (p=0.001), stressful life events (p=0.003), and pregnancy status (p=0.0001). A logistic regression showed that pregnant status (Unplanned/unwanted pregnancy) was the most contributor to postpartum depression (β=0.377, t=5.138, p=0.0001). **Conclusion:** This study identified a high rate of postpartum depression with related factors, including mother's age, childcare stress, life stress, and unplanned/ unwanted pregnancy. Screening for postpartum depression is required to ensure early detection among postpartum mothers.

1. Introduction

The postpartum period is a time of adaptation to a non-pregnant state after childbirth, during which mothers experience physical, emotional, and mental changes (Sylven et al., 2017). Postpartum depression (PPD) is one of the mental health effects that mothers can experience after giving birth. As a mood disorder, mothers can experience PPD for up to one year after delivery. The symptoms of PPD include anxiety, irritability, difficulty sleeping, no appetite, and difficulty paying attention to the baby (O'Hara & McCabe, 2013).

PPD can occur during the first year after birth (American Psychiatric Association, 2013) and will negatively impact the mother, husband, family, and baby. When experiencing PPD, mothers tend to have difficulty thinking clearly when making decisions. Furthermore, they may have appetite disorders, persistent low mood, and a feeling of sadness, while also perceiving that they are not good mothers to their babies (Sulfianti et al., 2021). Over the longer term, the potential negative impacts of PPD include a deterioration in the mother–infant relationship, delays in infant development, and the effect on child behavior (Potter et al., 2019).

Studies conducted before the COVID-19 pandemic showed through meta-analysis that the rate of prevalence of PPD stood at 17% among healthy postpartum women (Wang et al., 2021), with the highest incidence in Middle Eastern and Asia countries (26%) and the lowest incidence in European countries (8%) (Shorey et al., 2018). Meanwhile, the prevalence of PPD in Indonesia stood at 11.76%–18.37% (Nurbaeti et al., 2019; Wang et al., 2021). During the COVID-19

pandemic, certain countries recorded a higher prevalence of PPD in the range of 31.82%–44.44%, for example, Myanmar, Mexico, Italy, Turkey, and the UK (Chen et al., 2022).

After the World Health Organization (WHO) declared the outbreak of COVID-19 a pandemic in January 2020, including in Indonesia in March 2020, the psychological impact on the community led to many responses, including anxiety, depression, and post-traumatic stress (WHO, 2020). Ongoing psychological impacts during pregnancy and childbirth can result in mothers experiencing psychological disorders during their postpartum period. However, amid the COVID-19 pandemic, the psychological well-being of women during the postpartum period was neglected and often overlooked (Chen et al., 2022).

Many previous studies worldwide have documented the contributing factors to PPD before the COVID-19 pandemic, such as depression during pregnancy, stress in childcare, stress in live events, social support, anxiety during pregnancy, marital satisfaction, history of previous depression, infant temperament, maternity blues, and self-esteem (Franck et al., 2016; O'Hara & Mc Cabe, 2013), as well as socioeconomic status (Chang et al., 2016), marital status, and unplanned/unwanted pregnancy (Falah-Hassani et al., 2016; O'Hara & Mc Cabe, 2013; Smorti et al., 2019). The COVID-19 pandemic has influenced women's mental health, particularly in vulnerable groups such as mothers after birth (WHO, 2020). As a result, the prevalence of PPD increases higher than in non-pandemic era. Studies on PPD were conducted in various countries during the COVID-19 pandemic (Safi-Keykaleh et al., 2022; Shuman et al., 2022; Usmani et al., 2021). Meanwhile in Indonesia, Solikhah et al. (2022) found that the determinant factor of PPD during the COVID-19 was first-time mothers and attitudes. At the same time, other factors have not been documented. Therefore, it is important to develop the knowledge of PPD and its contributing factors. Accordingly, this study was conducted to explore postpartum depression among mothers and its contributing factors, including childcare stress, life stress, social support, marital satisfaction, and pregnancy status.

2. Methods

2.1 Research design
This study employed a cross-sectional research design. This research design was adopted to measure the independent and dependent variables simultaneously at the same time.

2.2 Setting and samples
The study was conducted from April to May 2022. The study setting was the maternal and child clinic of the public health center in North Jakarta, Indonesia, as an entry point to find the proposed participants. The accidental sampling technique was used to recruit the participants following the inclusion criteria: mothers with a postpartum period of one month to one year after delivery, a live baby, healthy and with no complications, and married. Meanwhile, twin babies, mothers with preterm labor, and mothers who had been diagnosed with mental problems were excluded from the study. The number of samples was 110 postpartum mothers determined using the G-power analysis.

2.3 Measurement and data collection
Six questionnaires were used in this study. The demographic data consisted of respondents' characteristics and the babies, including the mother's education, mother's age, working status, family income, previous exposure to COVID-19, baby's gender, number of children, and pregnancy status. Other instruments were the Edinburgh Postnatal Depression Scale (EPDS) questionnaire developed by Cox et al. (1987) to measure postpartum depression, Childcare Stress Inventory (CSI) questionnaire developed by Cutrona (1983) to measure childcare stress, the modified Life Events Questionnaire (LEQ) developed by Norbeck (1984) to measure life stress, Postpartum Support Questionnaire (PSQ) developed by Logsdon et al., (1994) to assess respondents' perceptions of the support received during the postpartum period, and the Dyadic Adjustment Scale (DAS) questionnaire developed by Spanier (1976) to measure marital satisfaction. All instruments have been translated into Bahasa Indonesia in a previous study (Nurbaeti et al., 2018).

The EPDS consists of 10 question items with a score of 0 to 3 on each item; it thus produces a total score in the range of 0–30, where a score of 12 or more indicates PPD (Bhusal et al., 2016; Nurbaeti et al., 2019; Sylven et al., 2017). In addition, the instrument's validity and reliability have

already been proven; the validity test results in the range of 0.333-0.694, and the reliability test produced a Cronbach's alpha value of 0.80 (Nurbaeti et al., 2019).

The CSI consists of 20 question items, each of which has a score of 0 (not disappointing) to 100 (disappointing). This instrument produces scores in the range of 0-2000; the cut-off score was 342. A score of 342 and more indicated experience of stress in childcare. A validity test result in the range of 0.155-0.488 and a reliability test result of 0.74 (Nurbaeti et al., 2019).

The original LEQ contained 10 question items, and Nurbaeti et al. (2018) added five items to make it suitable for use with postpartum mothers. This modified LEQ thus contains 15 question items with scores ranging from 0 (no effect) to 3 (excellent effect). It gives a total score in the range of 0-45, where a total score of more than 14 shows that life stress occurred. The validity test showed a value in the range of 0.267-0.611, while the reliability test revealed a Cronbach's alpha value of 0.83 (Nurbaeti et., 2019).

PSQ comprises 34 question items, with each item being scored from 0 (not helpful) to 7 (much help). The total scores range from 0 to 238, with a cut-off score of 191 indicating more support received. The result of the validity test was in the range of 0.155-0.448, and the reliability test result was 0.98 (Nurbaeti et al., 2019).

The DAS consists of 32 questions. The total score is in the range of 0-151, with a cut-off score of <100 indicating dissatisfaction in the marital relationship. The validity test is in the range of 0.157-0.629, and the reliability test result showed a Cronbach's alpha value of 0.73 (Nurbaeti et al., 2019).

The data were collected through home visits. Candidates of the participants who met the inclusion criteria from the maternal and child clinic in the public health center were persuaded to participate in the study. If they concurred to participate, the researcher requested their phone number and home address and made an appointment to visit. The researcher then visited the participants' homes as agreed. After each participant had provided their consent, they filled out the questionnaire, which took around 20 minutes. The researcher and participant did a health protocol such as hand wash before and after contact, wearing a face mask, and keeping a distance during data collection.

2.4 Data analysis

Univariate statistics were used to describe the respondents' characteristics and the variables studied. Bivariate analysis was performed using t-test to analyze the relationship between mother's age and the number of children with PPD and Fisher exact test was used to analyze the relationship between working status, COVID-19 survivor, baby gender, childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy with PPD. Furthermore, one-way ANOVA was performed to analyze the relationship of mothers' education and family income with PPD. The ENTER logistic regression method was performed to analyze the factors that contribute to PPD.

2.5 Ethical considerations

The ethical approval of this study was obtained from the Health Research Ethics Committee of the Faculty of Health Sciences, UIN Syarif Hidayatullah Jakarta with a reference number of UN.01/F.10/KP.01.1/KE.SP/04.08.023/2022. The principle of anonymity in the data collection was considered. It relates to the questions posed to respondents about names to prevent double data. Prior to the recruitment of participants, the researcher explained the purpose and benefits of the research to the candidate respondents. They signed an informed consent letter for their participation.

3. Results
3.1 Characteristics of respondents

Table 1 contains a brief summary of the respondents' characteristics and the babies. The youngest mothers were 20 years old, and the oldest were 45 years old. The majority graduated from senior high school (60.90%) and were housewives (69.10%). Furthermore, 81.82% have an average monthly family income of IDR 5.000.000 (US$ 400) or less and 20.90% had a history of exposure to COVID-19. The analysis found that the mother's age contributed to PPD while the other characteristics did not.

Table 1. Characteristics of respondents (n=110)

Variable	n (%)	Postpartum Depression	No Postpartum Depression	p-value
Mothers' education				
Elementary School	7 (6.37%)	2	5	0.918
Junior High School	7 (6.37%)	2	5	
Senior High School	67 (60.90%)	23	44	
University	29 (26.36%)	8	21	
Mothers' age (years)	Min – Max = 20 - 45			
	Mean = 28.56 (SD= 5.745)	Mean= 26.20	Mean=29.67	0.011
	Median = 27.00			
Working Status				
Working	34 (30.90%)	9	25	0.559
Housewives	76 (69.10%)	26	50	
Family Income in IDR (equal US$)				
< 2.500.000 (200)	46 (41.82%)	16	30	0.735
2.500.000-5.000.000 (200-400)	44 (40.00%)	14	30	
> 5.000.000 (>400)	20 (18.18%)	5	15	
COVID-19 exposure				
Yes	23 (20.90)	5	18	0.360
No	87 (79.10%)	30	57	
Baby's gender				
Boy	55 (50.00%)	17	38	1.000
Girl	55 (50.00%)	18	37	
Number of Children	Min-Max = 1-5			0.324
	Mean = 1.78 (SD=0.971)	Mean=1.60	Mean=2.35	
	Median = 1.00			

Note: The t-test was used to analyze mother's age and the number of children with PPD; the Fisher exact test was sued to analyze the relationship between working status, COVID-19 survivor, baby gender; one-way ANOVA was used to analyze mothers' education and family income with PPD.

3.2 The prevalence of postpartum depression

As shown in Table 2, the prevalence of PPD among mothers during the COVID-19 pandemic era in this study was 31.82%.

Table 2. The prevalence of postpartum depression among mothers during the COVID-19 pandemic

Postpartum Depression		No Postpartum Depression	
n	%	n	%
35	31.82	75	68.18

3.3 Contributing factors of postpartum depression: childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy

Table 3 presents the bivariate analysis using Chi-square analysis to test the relationship between the various contributing factors and PPD. The results show that childcare stress (*p*=0.001), stressful life events (*p=0.003*), and planned/wanted pregnancy (0.0001) have a significant contribution to PPD, while social support (*p*=1.000) and marital satisfaction *(p*=1.000) have not contributed to PPD.

To complete the analysis, the researcher performed a logistic regression using the ENTER method. All the significant variables were included in the analysis. It showed that the mother's age, childcare stress, life stress, and pregnancy status could explain 49% of the variance in PPD (R^2=0.490; F=25.190; *p*=0.0001). Pregnancy status explained the most variance (β=0.377, t=5.138, *p*=0.0001) followed by life stress (β=0.304, t=3.920, *p*=0.0001), mother's age (β=-0.223, t=-3.123, *p*=0.002), and childcare stress (β=0.221, t=2.776, *p*=0.007) (Table 4).

Table 3. Contributing factors to PPD: Child care stress, life stress, social support, marital satisfaction and unplanned/unwanted pregnancy and postpartum depression (n=110)

Variable	Postpartum Depression		X²	*p*-value
	No	Yes		
Childcare Stress				
No	46 (41.81%)	9 (8.19%)	10.728	0.001
Yes	29 (26.37%)	26 (23.63%)		
Life Stress				
No	41 (37.27%)	8 (7.27%)	8.530	0.003
Yes	34 (30.90%)	27 (24.55%)		
Social Support				
High	36 (32.73%)	23 (20.91%)	2.341	0.126
Low	39 (35.45%)	12 (10.91%)		
Marital Satisfaction				
Yes	66 (60.00%)	31 (28.18%)	0.000	1.000
No	9 (8.18%)	4 (3.64%)		
Pregnant Status				
Planned/Wanted	74 (67.27%)	22 (20.00%)	24.420	0.0001
Unplanned/Unwanted	1 (0.91%)	13 (11.82%)		

Note: Analysis was conducted by using the Fisher exact test

Table 4. Contribution of mother's age, childcare stress, life stress, and pregnancy status to PPD during the COVID-19 pandemic in North Jakarta, Indonesia (n=110)

	Unstandardized Coefficients		Standardized Coefficients	t	*p*	95.0% CI for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	5.044	2.308		2.185	0.031	0.467	9.621
Mothers age	-0.214	0.068	-0.223	-3.123	0.002	-0.350	-0.078
Childcare stress	0.004	0.001	0.221	2.776	0.007	0.001	0.006
Life Stress	0.152	0.039	0.304	3.920	0.0001	0.075	0.229
Pregnancy Status	6.198	1.206	0.377	5.138	0.0001	3.807	8.590

R=0.700; R² = 0.490; F= 25.190; *p*= 0.0001

4. Discussion

This study aimed to determine PPD among mothers and its contributing factors, including childcare stress, life stress, social support, marital satisfaction, and unplanned/unwanted pregnancy. In this study, the prevalence of PPD among mothers during the COVID-19 pandemic in North Jakarta, Indonesia, using a cut-off score of 12, was 31.82%. This rate was much higher than those found in studies conducted before the pandemic. For instance, Nurbaeti et al. (2019) found that 19.88% of postpartum mothers in South Jakarta, Indonesia, experienced depressive symptoms following childbirth. More recently, a study by Solikhah et al. (2022) found that 57% of mothers experienced PPD in Malang, East Java, Indonesia. In the general population, Sarfika et al. (2021) found higher about 71.70% of the population in Indonesia with depressive symptomatology during the pandemic. This study's finding is similar to that of Chen et al. (2022) who concluded that the prevalence of PPD was 34%. McFarland et al. (2021) reported that women in New Jersey, USA, who gave birth in March 2020, at the beginning of the COVID-19 pandemic, were more likely to have higher levels of depressive symptoms than women who gave birth before the COVID-19 pandemic. Hummel et al. (2022) found that 32.9% of Kenyan women tended to experience PPD symptoms during the COVID-19 pandemic. These research findings show that the COVID-19 pandemic could have had a detrimental effect on maternal mental well-being among women after childbirth (Chen et al., 2021).

This study showed that unwanted or unplanned pregnancy was the strongest contributor to PPD with OR 95%; CI 3.807–8.590. This explains why mothers with unplanned or unwanted pregnancies tended to experience PPD 3-8 times more often than mothers who planned or wanted to become pregnant. An unwanted or unplanned pregnancy can considerably alter the lives of women and their families as well as their socio and economic condition. The present study amplified previous studies (Abbasi et al., 2013; Brito et al., 2015; Kettunen et al., 2016; Surkan et

al., 2018). Surkan et al. (2018), in a study in Bangladesh, found that mothers with unwanted pregnancies tended to be at higher risk of experiencing depressive symptoms compared with mothers who wanted their pregnancies. Women who perceived that their husbands did not want the pregnancy were also at higher risk of prenatal and postnatal depressive symptoms. Furthermore, Brito et al. (2015) reported a frequency of unwanted pregnancy of 60.2%; among those women, 25.9% experienced PPD symptoms. Therefore, women who perceived their pregnancy was unwanted had higher symptoms of PPD (Brito et al., 2015). Similarly, Abbasi et al. (2013) identified a higher prevalence of PPD among first-time mothers if they perceived their pregnancy was unwanted compared with wanted pregnancies; however, unwanted pregnancy was not significantly associated with PPD. Wanted pregnancy relates to women's readiness to become a mother and assume the role of motherhood.

The COVID-19 pandemic increased the tension and anxiety for many people, particularly in vulnerable communities such as postpartum mothers. Communities were forced to adapt in the face of the pandemic; for example, maternal health facilities were closed at the start of the outbreak, regional quarantines were imposed, and lockdowns and social distancing became part of people's lives (Bhattacharjee & Ghosh, 2022). In our study, life stress was found to significantly contribute to PPD. This finding is consistent with those from previous studies conducted before the COVID-19 pandemic. Qobadi et al. (2016) reported depressive symptomatology among postpartum women associated with life stress. Women who notified more scores of life stress experienced a much higher level of PPD symptoms compared to those who had lower levels of life stress. Such events included trauma-related stress, financial stress, and emotional stress. Similarly, Al Nasr et al. (2020) and Nurbaeti et al. (2019) identified that stressful life events were the strongest contributor to PPD. During the COVID-19 pandemic, Cameron et al. (2020), in a study conducted in Canada, found a significant correlation between stress and PPD. They reported a greater stress score during the previous month, of 1.03-2.99, thus indicating that time can predict maternal depression. Salm Ward et al. (2017), despite conducting their study before the COVID-19 pandemic, also identified that life stress, such as dissent with a partner, hardship in bill payables, and separation or divorce, was relevant as significant predictors of an increased likelihood of PPD. Experiencing high stress in any domain has been found to significantly predict PPD, followed by a combination of high relational and financial stress. Furthermore, Kettunen et al. (2016) reported that negative life events such as the death of a loved one, sickness (self or child/family), marital relationship problems, and socioeconomic problems also contributed to PPD.

Our study showed that childcare stress made a significant contribution to PPD. During the postpartum period, mothers experience physical, emotional, and psychological changes as part of the adjustment to a non-pregnant state. In Indonesian culture, a woman must also take care of her babies. During the COVID-19 pandemic, when mobility was restricted, some women's inability to involve their extended family in care for their newborns posed a challenge. Therefore, readiness to become a parent can lead to stress, which includes taking care of the baby. Mothers also faced the added fear of either themselves or their babies becoming infected with COVID-19. The present study aligns with previous studies (Kettunen et al., 2016; Kim et al., 2019; Nurbaeti et al., 2018 and 2019) on aspects of childcare stress. Kettunen et al. (2016), for example, found that a deterioration in the relationship between infant and mother tended to increase the risk of PPD by 1–2 times. In Korea, postpartum period women who received attended Sanhujori care facilities felt comfortable and could be rested and relaxed. This type of intervention during the postpartum period could therefore reduce depressive symptoms. After they came back to their returning homes, they became worried about taking care of their babies (Kim et al., 2019).

According to our study, the mother's age significantly contributed to PPD, with a negative beta score. As such, the youngest women had higher depressive symptom scores than the older women, thus indicating that maternal age is linked to women's maturity to deal with the role of motherhood. In this regard, this study was consistent with other studies conducted during the COVID-19 pandemic. Suárez-Rico et al. (2021) reported that the mother's age was a significant predictor of PPD. In a literature review, Chen et al. (2022) found that respondents' socio-demographic characteristics, marital status, woman's age, and employment status were significantly correlated with PPD. Iwata et al. (2016) identified that younger and first-time mothers tended to experience depressive symptoms during the postpartum period compared to older first-time mothers or more than one child. Moreover, maturity, stability of the marriage

relationship, and experience in taking care of the baby were the possible factors that older first-time mothers and mothers who have more than one child are more likely to have less depressive symptoms (Iwata et al., 2016).

Interestingly, marital satisfaction and social support did not significantly contribute to PPD, which was contrary to the findings of previous studies (Al Nasr et al., 2020; Chen et al., 2022; Nurbaeti et al., 2018; Nurbaeti et al., 2019). This may reflect the fact that during the COVID-19 pandemic, communities received support from the government in the form of social service programs and direct cash assistance. Restrictions on movement may also have led to increased levels of domestic help for postpartum women from husbands or relatives.

5. Implications and limitations

This study has implications for nursing practices and health policies concerning the prevention of PPD among postpartum mothers and the preservation of their mental health. Early detection is needed to prevent PPD, for instance, conducting socialization with all postpartum mothers on the independent use of postpartum depression screening applications. Health workers can also provide maximum support regarding the prevention and management of PPD. This would assist mothers in knowing when to seek help for further treatment. In addition, by learning about the factors that contribute to PPD, nurses and other health workers can provide support in the form of knowledge about physical and psychological changes during the postpartum period, psychological adaptation of postpartum, how to take care of the baby, breastfeeding, and the things that postpartum mothers need, especially in the context of the COVID-19 pandemic.

This study, nevertheless, has some limitations. First, while it adopted a cross-sectional design, the independent and dependent variables were explored only once with no follow-up. Second, the use of accidental sampling in this study to identify participants who met the criteria did not fully represent Indonesian mothers in Jakarta.

6. Conclusion

In conclusion, our findings revealed a greater prevalence of PPD during the COVID-19 pandemic than before it began. Factors including the mother's age, childcare stress, life stress, and unplanned/unwanted pregnancy were identified as contributors to PPD. Collaboration between maternity nurses, community nurses, and midwives is needed to promote knowledge about PPD through offline and online media. Collaboration with medical doctors and psychologists may also be required in terms of helping mothers deal with mental health problems through counseling or therapeutic regimens. There is a need to develop nursing interventions among antenatal and postpartum mothers to prevent PPD. Further research is also needed to explore the impact of PPD on the mother–child relationship and couples' relationships in a longitudinal study.

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Author contribution
All authors have contributed to this study, including the concept, design, data collection, management, and analysis, and the drafting and writing up of the manuscript.

Conflict of interest
No conflict of interest is stated among the authors.

References
Abbasi, S., Chuang, C. H., Dagher, R., Zhu, J., & Kjerulff, K. (2013). Unintended pregnancy and postpartum depression among first-time mothers. *Journal of Women's Health*, *22*(5), 412–416. https://doi.org/10.1089/jwh.2012.3926

Al Nasr, R. S., Altharwi, K., Derbah, M. S., Gharibo, S. O., Fallatah, S. A., Alotaibi, S. G., Almutairi, K. A., & Asdaq, S. (2020). Prevalence and predictors of postpartum depression in Riyadh,

Saudi Arabia: A cross-sectional study. *PloS One, 15*(2), e0228666. https://doi.org/10.1371/journal.pone.0228666

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders.* American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Bhattacharjee, A., & Ghosh, T. (2022). COVID-19 pandemic and stress: Coping with the new normal. *Journal of Prevention and Health Promotion, 3*(1), 30–52. https://doi.org/10.1177/26320770211050058

Bhusal, B. R., Bhandari, N., Chapagai, M., & Gavidia, T. (2016). Validating the Edinburgh Postnatal Depression Scale as a screening tool for postpartum depression in Kathmandu, Nepal. *International Journal of Mental Health Systems, 10,* 71-77. https://doi.org/10.1186/s13033-016-0102-6

Brito, C. N. de O., Alves, S. V., Ludermir, A. B., & Araújo, T. V. B. de. (2015). Postpartum depression among women with unintended pregnancy. *Revista de Saúde Pública, 49,* 33. https://doi.org/10.1590/S0034-8910.2015049005257

Cameron, E. E., Joyce, K. M., Delaquis, C. P., Reynolds, K., Protudjer, J. L. P., & Roos, L. E. (2020). Maternal psychological distress & mental health service use during the COVID-19 pandemic. *Journal of Affective Disorders, 276,* 765–774. https://doi.org/10.1016/j.jad.2020.07.081

Chang, F.-W., Lee, W.-Y., Liu, Y.-P., Yang, J.-J., Chen, S.-P., Cheng, K.-C., Lin, Y.-C., Ho, T.-W., Chiu, F.-H., Hsu, R.-J., & Liu, J.-M. (2016). The relationship between economic conditions and postpartum depression in Taiwan: A nationwide population-based study. *Journal of Affective Disorders, 204,* 174–179. https://doi.org/10.1016/j.jad.2016.06.043

Chen, Q., Li, W., Xiong, J., & Zheng, X. (2022). Prevalence and risk factors associated with postpartum depression during the COVID-19 pandemic: A literature review and meta-analysis. *International Journal of Environmental Research and Public Health, 19*(4), 2219. https://doi.org/10.3390/ijerph19042219

Chen, S., Chen, K., Wang, S., Wang, W., & Li, Y. (2021). Initial validation of a Chinese version of the mental health literacy scale among Chinese teachers in Henan Province. *Frontiers in Psychiatry, 12,* 661903. https://doi.org/10.3389/fpsyt.2021.661903

Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry, 150,* 782-786. http://doi.org/10.1192/bjp.150.6.782

Cutrona, C.E. (1983). Causal attributions and perinatal depression. *Journal of Abnormal Psychology, 92*(2), 161–72. https://doi.org/10.1037/0021-843X.92.2.

Falah-Hassani, K., Shiri, R., & Dennis, C.-L. (2016). Prevalence and risk factors for comorbid postpartum depressive symptomatology and anxiety. *Journal of Affective Disorders, 198,* 142–147. https://doi.org/10.1016/j.jad.2016.03.010

Falgas-Bague, I., Thembo, T., Kaiser, J. L., Hamer, D. H., Scott, N. A., Ngoma, T., Paul, R., Juntunen, A., Rockers, P. C., & Fink, G. (2023). Trends in maternal mental health during the COVID-19 pandemic–Evidence from Zambia. *PLoS One, 18*(2), e0281091. https://doi.org/10.1371/journal.pone.0281091

Franck, E., Vanderhasselt, M.-A., Goubert, L., Loeys, T., Temmerman, M., & De Raedt, R. (2016). The role of self-esteem instability in the development of postnatal depression: A prospective study testing a diathesis-stress account. *Journal of Behavior Therapy and Experimental Psychiatry, 50,* 15–22. https://doi.org/10.1016/j.jbtep.2015.04.010

Hummel, A. D., Ronen, K., Bhat, A., Wandika, B., Choo, E. M., Osborn, L., Batra, M., Kinuthia, J., Kumar, M., & Unger, J. A. (2022). Perinatal depression and its impact on infant outcomes and maternal-nurse SMS communication in a cohort of Kenyan women. *BMC Pregnancy and Childbirth, 22*(1), 1–16. https://doi.org/10.1186/s12884-022-05039-6

Iwata, H., Mori, E., Sakajo, A., Aoki, K., Maehara, K., & Tamakoshi, K. (2016). Prevalence of postpartum depressive symptoms during the first 6 months postpartum: Association with maternal age and parity. *Journal of Affective Disorders, 203,* 227–232. https://doi.org/10.1016/j.jad.2016.06.002

Kettunen, P., Koistinen, E., & Hintikka, J. (2016). The connections of pregnancy-, delivery-, and infant-related risk factors and negative life events on postpartum depression and their role in first and recurrent depression. *Depression Research and Treatment, 2016,* 1–7. https://doi.org/10.1155/2016/2514317

Kim, Y., SookbinIm, S., Dee, V., Brandt, C., & Hong, E. (2019). Feelings, self-care, and infant care reported by Korean women at risk for postpartum depression. *International Journal of Nursing, 6*(1) , 1-11. https://doi.org/10.15640/ijn.v6n1a1

Logsdon, M. C., McBride, A. B., & Birkimer, J. C. (1994). Social support and postpartum depression. *Research in Nursing & Health, 17*(6), 449–457. https://doi.org/10.1002/nur.4770170608.

McFarland, M. J., McFarland, C. A. S., Hill, T. D., & D'Oria, R. (2021). Postpartum depressive symptoms during the beginning of the COVID-19 pandemic: An examination of population birth data from Central New Jersey. *Maternal and Child Health Journal, 25*(3), 353–359. https://doi.org/10.1007/s10995-020-03116-w

Norbeck, J.S. (1984). Modification of life event questionnaire for use with female respondents. *Research in Nursing & Health. 7*(1), 67–71. https://www.ncbi.nlm.nih.gov/pubmed/6565302.

Nurbaeti, I., Deoisres, W., & Hengudomsub, P. (2019). Association between psychosocial factors and postpartum depression in South Jakarta, Indonesia. *Sexual & Reproductive Healthcare, 20*, 72–76. https://doi.org/10.1016/j.srhc.2019.02.004

Nurbaeti, I., Deoisres, W., & Hengudomsub, P. (2018). Postpartum depression in Indonesian mothers: Its changes and predicting factors. *Pacific Rim International Journal of Nursing Research, 22*(2), 93–105. Available from: https://heo2.tci-thaijo.org/index.php/PRIJNR/article/view/84760

O'Hara, M. W., & McCabe, J. E. (2013). Postpartum depression: Current status and future directions. *Annual Review of Clinical Psychology, 9*(1), 379–407. https://doi.org/10.1146/annurev-clinpsy-050212-185612

Potter, P. A., Perry, A. G., Stockert, P. A., Hall, A., Novieastari, E., Ibrahim, K., & Deswani, D. (2019). *Fundamentals of nursing vol 2- 9th Indonesian edition* (Deswani, E. Novieastari, K. Ibrahim, & S. Ramdaniati (eds.)). Elsevier Health Sciences.

Qobadi, M., Collier, C., & Zhang, L. (2016). The effect of stressful life events on postpartum depression: Findings from the 2009–2011 Mississippi pregnancy risk assessment monitoring system. *Maternal and Child Health Journal, 20*(S1), 164–172. https://doi.org/10.1007/s10995-016-2028-7

Safi-Keykaleh, M., Aliakbari, F., Safarpour, H., Safari, M., Tahernejad, A., Sheikhbardsiri, H., & Sahebi, A. (2022). Prevalence of postpartum depression in women amid the COVID-19 pandemic: A systematic review and meta-analysis. *International Journal of Gynaecology and Obstetrics, 157*(2), 240–247. https://doi.org/10.1002/ijgo.14129

Salm Ward, T., Kanu, F. A., & Robb, S. W. (2017). Prevalence of stressful life events during pregnancy and its association with postpartum depressive symptoms. *Archives of Women's Mental Health, 20*(1), 161–171. https://doi.org/10.1007/s00737-016-0689-2

Sarfika, R., Malini, H., Putri, D. E., Buanasari, A., Abdullah, K. L., & Freska, W. (2021). Factors influencing depression among Indonesians during the COVID-19 outbreak. *Nurse Media Journal of Nursing, 11*(3), 380–388. https://doi.org/10.14710/nmjn.v11i3.36783

Shorey, S., Chee, C. Y. I., Ng, E. D., Chan, Y. H., Tam, W. W. S., & Chong, Y. S. (2018). Prevalence and incidence of postpartum depression among healthy mothers: A systematic review and meta-analysis. *Journal of Psychiatric Research, 104*, 235–248. https://doi.org/10.1016/j.jpsychires.2018.08.001

Shuman, C. J., Peahl, A. F., Pareddy, N., Morgan, M. E., Chiangong, J., Veliz, P. T., & Dalton, V. K. (2022). Postpartum depression and associated risk factors during the COVID-19 pandemic. *BMC Research Notes, 15*, 102. https://doi.org/10.1186/s13104-022-05991-8

Smorti, M., Ponti, L., & Pancetti, F. (2019). A comprehensive analysis of postpartum depression risk factors: The role of socio-demographic, individual, relational, and delivery characteristics. *Frontiers in Public Health, 7* (295), 1-10. https://doi.org/10.3389/fpubh.2019.00295

Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and Family, 38*, 15-28. http://dx.doi.org/10.2307/350547

Solikhah, F. K., Nursalam, N., Subekti, I., Winarni, S., & Yudiernawati, A. (2022). Determination of factors affecting postpartum depression in primary healthcare during the COVID-19

pandemic. *Journal of Public Health in Africa, 13*(s2). https://doi.org/10.4081/jphia.2022.2408

Suárez-Rico, B. V., Estrada-Gutierrez, G., Sánchez-Martínez, M., Perichart-Perera, O., Rodríguez-Hernández, C., González-Leyva, C., Osorio-Valencia, E., Cardona-Pérez, A., Helguera-Repetto, A. C., Espino y Sosa, S., Solis-Paredes, M., & Reyes-Muñoz, E. (2021). Prevalence of depression, anxiety, and perceived stress in postpartum Mexican women during the COVID-19 lockdown. *International Journal of Environmental Research and Public Health, 18*(9), 4627. https://doi.org/10.3390/ijerph18094627

Sulfianti, S., Nardina, E. A., Hutabarat, J., Astuti, E. D., Muyassaroh, Y., Yuliani, D. R., Hapsari, W., Azizah, N., Hutomo, C. S., Argahen, N. B., & others. (2021). *Asuhan Kebidanan pada Masa Nifas [Maternity care during postpartum period].* Yayasan Kita Menulis.

Surkan, P. J., Strobino, D. M., Mehra, S., Shamim, A. A., Rashid, M., Wu, L. S.-F., Ali, H., Ullah, B., Labrique, A. B., Klemm, R. D. W., West, K. P., & Christian, P. (2018). Unintended pregnancy is a risk factor for depressive symptoms among socio-economically disadvantaged women in rural Bangladesh. *BMC Pregnancy and Childbirth, 18*(1), 490. https://doi.org/10.1186/s12884-018-2097-2

Sylvén, S. M., Thomopoulos, T. P., Kollia, N., Jonsson, M., & Skalkidou, A. (2017). Correlates of postpartum depression in first time mothers without previous psychiatric contact. *European Psychiatry, 40*, 4–12. https://doi.org/10.1016/j.eurpsy.2016.07.003

Usmani, S., Greca, E., Javed, S., Sharath, M., Sarfraz, Z., Sarfraz, A., Salari, S. W., Hussaini, S. S., Mohammadi, A., Chellapuram, N., Cabrera, E., & Ferrer, G. (2021). Risk factors for postpartum depression during COVID-19 pandemic: A systematic literature review. *Journal of Primary Care & Community Health, 12*, 21501327211059348. https://doi.org/10.1177/21501327211059348

Wang, Z., Liu, J., Shuai, H., Cai, Z., Fu, X., Liu, Y., Xiao, X., Zhang, W., Krabbendam, E., Liu, S., Liu, Z., Li, Z., & Yang, B. X. (2021). Mapping global prevalence of depression among postpartum women. *Translational Psychiatry, 11*(1), 543. https://doi.org/10.1038/s41398-021-01663-6

World Heath Organisation. (2020). *Coronavirus disease (COVID-19) pandemic.* World Health Organization. https://www.who.int/europe/emergencies/situations/covid-19