A 10-year systematic review and meta-analysis of determinants of postpartum depression in the Association of Southeast Asian Nations countries

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ABSTRACT

Introduction: Postpartum depression (PPD) is a mental and emotional condition that can affect women during their first postnatal year and concern globally. This study aimed to determine the overall prevalence and determinants of postpartum depression (PPD) in Association of Southeast Asian Nations (ASEAN) countries.

Materials and Methods: A systematic search of observational studies conducted in ASEAN countries between 1 January 2010 and 31 December 2020 was performed in the Medline, PubMed and Google Scholar databases. The quality of studies was evaluated based on The Joanna Briggs Institute Checklist. The analysis was performed with Review Manager software version 5.4. Meta-analysis of the estimates from primary studies was conducted by adjusting for possible publication bias and heterogeneity.

Results: Twenty-five studies including 19924 postnatal mothers were included in this review. The pooled prevalence of PPD is 22.32% (95% CI: 18.48, 26.17). Thailand has the highest prevalence of PPD with a pooled prevalence of 74.1% (95% CI: 64.79, 83.41). The prevalence of PPD was highest when the assessment for PPD was conducted up to 6 weeks postpartum with a pooled prevalence of 25.24% (95% CI: 14.08, 36.41). The identified determinants of PPD were unplanned pregnancy, term pregnancy, lack of family support and physical violence. There were limited studies done and high heterogeneity in terms of quality, methodology, culture, screening method and time of PPD measurement.

Conclusions: Approximately one in five postpartum women in ASEAN countries had PPD. The risk factor that lowers the risk of PPD is unplanned and term pregnancies, while women with a lack of family support and experienced physical violence increase the risk of PPD. Robust prevalence studies are needed to assess the magnitude of this problem in ASEAN countries.

KEYWORDS:
Postnatal depression, postpartum depression, ASEAN countries, risk of postpartum depression

INTRODUCTION

Postpartum depression (PPD) is a mental and emotional condition that can affect women during their first postnatal year and is a concern globally.[1] It involves the woman herself and the family institution and, subsequently, the economy of the family itself.[2] PPD is often overlooked and causes morbidity to new mothers and their families. PPD is defined as a major depressive episode 'with peripartum onset if the onset of mood symptoms occurs during pregnancy or within four weeks following deliveries' based on the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5). Multiple studies and clinical practices define PPD as occurring within 4 weeks after childbirth, 3 months, 6 months or up to 12 months after delivery.

A recent systematic review and meta-analysis by Abel et al.[3] on 58 studies conducted between 2007 and 2017 reported that the PPD prevalence ranged between 18.2% and 25.6%. They also highlighted that the prevalence was higher in low-income countries, with a pooled prevalence of 25.8%, compared to middle-income countries, which was 20.7%. Wang et al.[4] conducted a systematic review and meta-analysis among 565 studies involving 1,236 365 women from inception and July 2021 found that the global prevalence of PPD is 17.22% (95% CI: 16.00, 18.51). They reported that South Africa has the highest prevalence, which is 39.96%.

The literature on PPD revealed several risk factors that can contribute to women's PPD. The risk factors are different among the developed and developing countries. It can be divided into socio-demographic categories, marital and pregnancy factors and psychosocial factors. The examples of socio-demographic factors are unintended or birth[5–7], occupation and marital status[8] and low socio-economic and education status.[6,9,10] For marital and pregnancy factors such as intimate partner violence,[11] domestic violence[5,12,13] psychosocial factors identified were partner conflict, perfectionism, lack of family and parental support, reduced social support,[6,10,14] and depression during pregnancy or history of depression before pregnancy.[5,10]

ASEAN countries comprise an intergovernmental organisation of 10 Southeast Asian countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam. The most

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striking characteristic of ASEAN countries is that it has a wide diversity of socio-cultural, hence different socio-economic statuses. We find many studies related to PPD in developed and other developing countries but very limited studies related to ASEAN countries. This can be due to a lack of exposure and intervention about PPD in women.

Therefore, in this systematic review and meta-analyses, we aimed to estimate the overall prevalence of PPD and its determinants in ASEAN countries. Findings from this study will be used to identify the need for early screening and detection, encourage the development of an intervention to reduce its occurrence and support women with PPD.

MATERIALS AND METHODS

A systematic review and meta-analysis of studies were conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.15 The protocol for this systematic review and meta-analysis has been registered in the PROSPERO (Protocol No. CRD42021234127), and the protocol includes only the determinants of PPD in ASEAN countries. The inclusion criteria are studies conducted in ASEAN countries that report the prevalence and determinants of PPD over 10 years from 1st January 2010 to 31st December 2020. Studies with cross-sectional, case–control and cohort designs published in English were included. Case series/reports, conference papers, proceedings, articles available only in abstract form, editorial reviews, letters of communication, commentaries and qualitative studies were excluded.

A systematic search was performed in the Medline (PubMed) and Google Scholar databases for articles between 1st January 2010 and 31st December 2020. The investigation was done using the Medical Subject Headings (MeSH) search terms: 'determinants,' 'risk factors,' 'postnatal depression,' 'perinatal depression,' 'maternal depression' and 'maternal blues'. Reference lists of included citations were cross-checked to find additional potentially eligible studies.

All records identified by our search strategy were exported to EndNote X8 software. Duplicate articles were removed. Two independent reviewers screened the titles and abstracts of the identified themes. The full texts of eligible studies were obtained and read thoroughly to assess their suitability. In a conflict between the two reviewers, a consensus discussion was held, and a third reviewer was consulted.

The data were extracted into Microsoft Excel. This included first author, year of publication, study location, study design, setting, study population, sample size, PPD definition, risk factors and data for the calculation of effect estimates. Data for risk factors included physical and biological, psychological, obstetric, paediatrics, socio-demographic and cultural factors.

A critical appraisal was done to assess the data quality using the Joanna Briggs Institute Meta-Analysis for cross-sectional, case–control and cohort studies (Aromataris and Munn, 2020). The risk of bias was considered low when more than 70% of the answers were 'yes,' moderate when 50–69% of the responses were 'yes' and high when up to 0%–49% of the answers were 'yes.' The risk factors were reported as an odds ratio with a 95% confidence interval. The analysis was performed with Review Manager software version 5.4 (Nordic Cochrane Centre). We used a random-effects model to pool data. The I2 statistic was used to assess heterogeneity and use the guide as outlined: 0%–40% might not be necessary; 30%–60% may represent moderate heterogeneity; 50%–90% may represent substantial heterogeneity and 75%–100% would be considerable heterogeneity; 50%–90% may represent significant heterogeneity 17Subgroup analysis was performed based on ASEAN countries and the time of assessment of the study design. Funnel plots were used to assess the publication bias.

RESULTS

Characteristics of the Included Studies

A total of 7609 articles were retrieved through an electronic search, of which 7559 were eligible for assessment after removing ten duplicate records. Of the 7559 articles screened for eligibility, 7250 were excluded. A total of 349 articles underwent full-text evaluation for eligibility, of which 312 were excluded because articleswere not from ASEAN countries (n = 293) but only prenatal depression (n = 19). In this review, 37 articles underwent quality assessment, of which 25 articles with low risk of bias were included in the final analysis, as shown in Fig 1, whereas four studies with a moderate risk of bias and six studies with a high risk of bias were excluded.

Table I shows 25 studies included in this review: Malaysia (n = 4),[11,16–18] Singapore (n = 3),[19–21] Thailand (n = 5),[14,22–25] Indonesia (n = 6),26–31, Vietnam (n = 5),32–36, Philippines (n = 1)8 and Laos (n = 1)37. Fifteen studies were cross-sectional,[8,11,14,16,22,23,26,28–32,34,36,37] two were case–control,[19,24] and eight were cohort studies.[17,18,20,21,25,27,33,35] According to the data, the smallest sample size was 31 women, and the largest was 6636 women. The majority of the included studies used Edinburgh Postnatal Depression Scale (EPDS), which is 21 studies out of 25.[8,11,14,17,18,20,21,23–31,33–37] From this, nine studies using cut-off points ≥12,[11,14,17,18,23,28,30,34,36] seven studies using cut-off points ≥10,[8,21,25,26,29,35,37] two studies using cut-off point ≥13,[20,27] one study using cut-off point ≥433 and ≥1124, respectively, and one study not explicitly mentioned the cut-off point.[31] Other than that, four studies using different types of measures of PPD, which are Mini International Neuropsychiatric Interview (MINI),[16] The Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV),[19] Center for Epidemiological Studies Depression Scale (CES-D)22 and Case-Finding Instruments for Depression.[32]

Prevalence of PPD in ASEAN Countries

A total of 25 studies were included, with a total of 19,924 samples size. The pooled prevalence of PPD was 22.32% (95% CI: 18.48, 26.17). Figures 2 and 3 show a funnel plot. A subgroup analysis based on countries was performed in Figure 4. Thailand showed the highest pooled prevalence of women with PPD, which is 74.10% (95% CI: 64.79, 83.41). This is because the study[22] was done among a particular group population of women with human immunodeficiency virus and a small sample size of 85 mothers. Apart from that, a limited number of studies are available, such as Laos[37] and The Philippines.[8]

Table I: Summary of research articles included in systematic review and meta-analysis for PPD in ASEAN countries

No.	Author	Study area (Region)	Study design	Sample Size	Measures of PPD	Prevalence of PPD (%)	Time of assessment	Factors associated with PPD
1	Zainal et al.[16]	Malaysia	Cross-sectional	411	MINI	6.8	6–8 weeks postpartum	- Housewife - Caesarian section - Previous history of depression - Non-exclusive breastfeeding
2	Yusuff et al.[17]	Malaysia	Cohort	2072	EPDS	14.3	1, 3 and 6 months postpartum	- Women depressed during pregnancy - Women with consistent worries of newborn
3	Norhayati et al.[18]	Malaysia	Cohort	742	EPDS	4.8 2.1	1 and 6 months postpartum 1 and 6 months postpartum	- Mother with SMM - Mother without SMM
4	Ahmad et al.[11]	Malaysia	Cross-sectional	6639	EPDS	4.4	6–16 weeks postpartum	- Exposed to intimate partner violence - Emotional violence - Unplanned pregnancy - Lack of family support during confinement - Partner's use of alcohol - Being from household with a low income
5	Suhitharan et al.[19]	Singapore	Case–control	744	DSM-IV	12.9	4–8 weeks postpartum	- Absence of labour epidural analgesia - Increasing age - Family history of depression - History of depression - Previous history of PPD
6	Tham et al.[24]	Singapore	Cohort	1247	EPDS	20.1	3 months postpartum	- Borderline high depressive/ anxiety symptoms - Poor subjective sleep quality during pregnancy
7	Teo et al.[20]	Singapore	Cohort	1249	EPDS	9.8	1 month postpartum	- Traditional-Indian-Confinement diet associated with less PPD symptoms
8	Ross et al.[22]	Thailand	Cross-sectional	85	CES-D	74.1	6 weeks postpartum	- Low self-esteem - Infant health status - Low education level
9	Panyayong et al.[23]	Thailand	Cross-sectional	1731	EPDS	8.4	12 months postpartum	- Maternal health - Marital conflict - Economic burden - Stressful life events - Previous depression
10	Roomruangwong et al.[24]	Thailand	Case–control	313	EPDS	16.9	4–6 weeks postpartum	- History of lifetime major depression & PPD - History of depression during pregnancy - Multiparity - Unwanted pregnancy - Childcare stress - Premenstrual syndrome - Pain symptoms during early purperium - Use of caffein during pregnancy - Baby feeding problem
11	Hassert et al.[14]	Thailand	Cross-sectional	225	EPDS	36.0	12 months postpartum	- Partner conflict - Perfectionism
12	Phoosuwan et al.[25]	Thailand	Cohort	449	EPDS	47	1 and 3 months postpartum	- Low income - Limited social support - Low psychological well being

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Table I: Summary of research articles included in systematic review and meta-analysis for PPD in ASEAN countries

No.	Author	Study area (Region)	Study design	Sample Size	Measures of PPD	Prevalence of PPD (%)	Time of assessment	Factors associated with PPD
13	Dira et al.[26]	Indonesia	Cross-sectional	44	EPDS	20.5	2 months postpartum	- Low maternal education - Primiparity - Maternal age <23 years old - Have a history of children death - Unwanted pregnancy
14	Nurbaeti et al.[27]	Indonesia	Cohort	283	EPDS	18.37 15.19 26.15	1 month postpartum 2 months postpartum 3 months postpartum	- Childcare stress - Marital satisfaction - Life stress - Non acceptance of baby gender
15	Putriarsih et al, 2018	Indonesia	Cross-sectional	200	EPDS	18.5	2–6 weeks postpartum	- Labor complication - Unwanted pregnancy - Low family income
16	Nurbaeti et al.[28]	Indonesia	Cross-sectional	166	EPDS	19.88	6 weeks postpartum	- Stressful life events - Childcare stress - Marital satisfaction
17	Usnawati et al.[31]	Indonesia	Cross-sectional	100	EPDS	49.0	12 months postpartum	- Smaller parity - Working mother - Lower husband support
18	Putra et al.[30]	Indonesia	Cross-sectional	31	EPDS	32.3	12 months postpartum	- Maternal age of postpartum
19	Suzuki et al.[32]	Vietnam	Cross-sectional	300	Case-Finding Instruments for Depression	23.1	3 months postpartum	- Parental and familial conflict - Recent moving - Lack of confidence in childrearing - Less relaxed feeing toward the child
20	Fisher et al.[33]	Vietnam	Cohort	497	EPDS	0.9 2.4	8 weeks postpartum 6 months postpartum	- Exposure to either lifetime or perinatal IPV (emotional abuse, physical and sexual violence
21	Murray et al.[34]	Vietnam	Cross-sectional	431	EPDS	18.1	6 months postpartum	- Poverty - Food insecurity - Being frightened of family members - Intimate partner violence
22	Tho Tran et al.[35]	Vietnam	Cohort	1274	EPDS	8.2	12 weeks postpartum	- Women exposed to emotional violence - Type of employment - Lack of family support after delivery - Lower level of education - Husband preference for a specific sex of child - Presence of mental disorder - Depression during pregnancy
23	Do et al, 2018	Vietnam	Cross-sectional	116	EPDS	27.6	< 1 year postpartum	- Low level of education - Being the first-time mothers - Dissatisfaction about family - Limited communication and interaction with others
24	Labrague et al.[8]	Philippines	Cross-sectional	165	EPDS	16.4	6 weeks postpartum	- Occupation - Marital status
25	Souphalak et al, 2020	Laos Laos	Cross-sectional	428	EPDS	31.8	6-8 weeks postpartum	- Unintended pregnancy - Low birth satisfaction - Depression during pregnancy

Note: PPD = postpartum depression, MINI: Mini International Neuropsychiatric Interview, EPDS: Edinburg Postnatal Depression Scale, DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, fourth edition, CES-D: Center for Epidemiological Studies Depression Scale, IPV: Intimate partner violence

Table II: Summary of risk factors included in systematic review and meta-analysis for PPD in ASEAN countries

Variables	Number of studies
Physical and biological factors	
Gestational diabetes in pregnancy	2
Hypertension in pregnancy	2
Health of the mothers	3
Psychological factor	
History of family death	2
Lack of family support	4
Little family attachment	3
Spouse assistance for child-rearing	4
Physical violence	2
Obstetric and paediatric factor	
Unplanned pregnancy	7
Term pregnancy	4
Low birth weight	3
Types of delivery	5
Labour difficulty	3
Parity	5
Breastfeeding	4
Socio-demographic factor	
Mother age	10
Mother education level	10
Marital status	4
Occupation of the mothers	8
Economic burden	3
Type of family	2
Urban area	2
Cultural factor	
Gender preferences	3

Factors Affecting PPD

A total of 25 studies reported risk factors for PPD. Similar factors were searched for in each study. The selected studies identified 23 risk factors, which were then divided into five groups as shown in Table II: (1) Physical and biological factors which include gestational diabetes in pregnancy,[19,36] hypertension in pregnancy,[19,36] health of the mothers;[19,23,32] (2) Psychological factor such as history of family death,[8,36] lack of family support,[17,23,24,35] little family attachment,[8,23,36] spouse assistance for child rearing,[8,17,23,31] physical violence;[23,35] (3) Obstetric and paediatric factor which were unplanned pregnancy,[8,16,17,19,23,24,37] term pregnancy,[8,23,35,37] low birth weight,[8,32,37] types of delivery,[8,16,17,19,37] labour difficulty,[8,19,37] parity[8,16,31,36,37] and breastfeeding;[8,16,23,36] (4) Socio-demographic factor which were mother age,[8,16,17,23,26,30,31,35–37] mother education level,[8,17,19,26,30–32,35–37] marital status,[8,19,23,37] occupational status of the mother,[817,19,30–32,35,37] economic burden,[23,32,37] type of family,[8,36] urban area[36,37] and (5) cultural factor which include gender preferences.[8,17,37]

In the meta-analyses, four factors were significantly associated with PPD, as shown in Figures 6–9. There was an unplanned pregnancy, term pregnancy, poor family support and physical violence. Seven studies[8,16,1719,23,24,37] with 5864 women were included to analyse the relationship between unplanned pregnancy and PPD. The pooled result showed that women with unplanned pregnancies had a lower risk of PPD with an odd of 0.69 compared to women with planned pregnancies (OR: 0.69, 95% CI: 0.53, 0.91). In comparison, four studies[8,23,35,37] with a total of 3598 women were included in this analysis for the association of term pregnancy with PPD. The pooled analysis showed that women with term pregnancy had a lower risk of PPD with an odds of 0.55 compared to women with preterm pregnancy (OR: 0.55, 95% CI: 0.40, 0.74). For the association of family support and PPD, four studies[17,23,24,35] were included for analysis, with a total of 5390 women involved. The pooled result showed that women lacking family support had a higher risk of PPD with odds of 5.10 compared to women with good family support (OR: 5.10, 95% CI: 1.95, 13.38). Meanwhile, two studies[23,35] were included with a total of 3005 women to assess the association between physical violence and PPD, which showed that women who experienced physical violence had a higher risk of PPD with the odds of 2.16 compared to women without (OR: 2.16, 95% CI:1.56, 2.99).

DISCUSSION

In this study, we found that the pooled prevalence of PPD in ASEAN countries was 22.32%, comparable with middle-income countries, which were 20.8%;[3] but lower than Middle East countries, which were 27%.[6] The prevalence of PPD in ASEAN countries was higher than the recently reported global prevalence estimates of 17.22%.[4] This estimated prevalence could be related to the limited number of research available in ASEAN countries and the fact that most ASEAN countries are from middle- and low-income countries.

Besides that, the pooled prevalence based on the subgroup analysis of the time of assessment showed a higher prevalence in the first 6 weeks of postpartum, which was 25.24%. This is slightly similar to the study3 whereby the prevalence of PPD was higher in the first ten weeks of postpartum. This is possibly due to women's attempts to

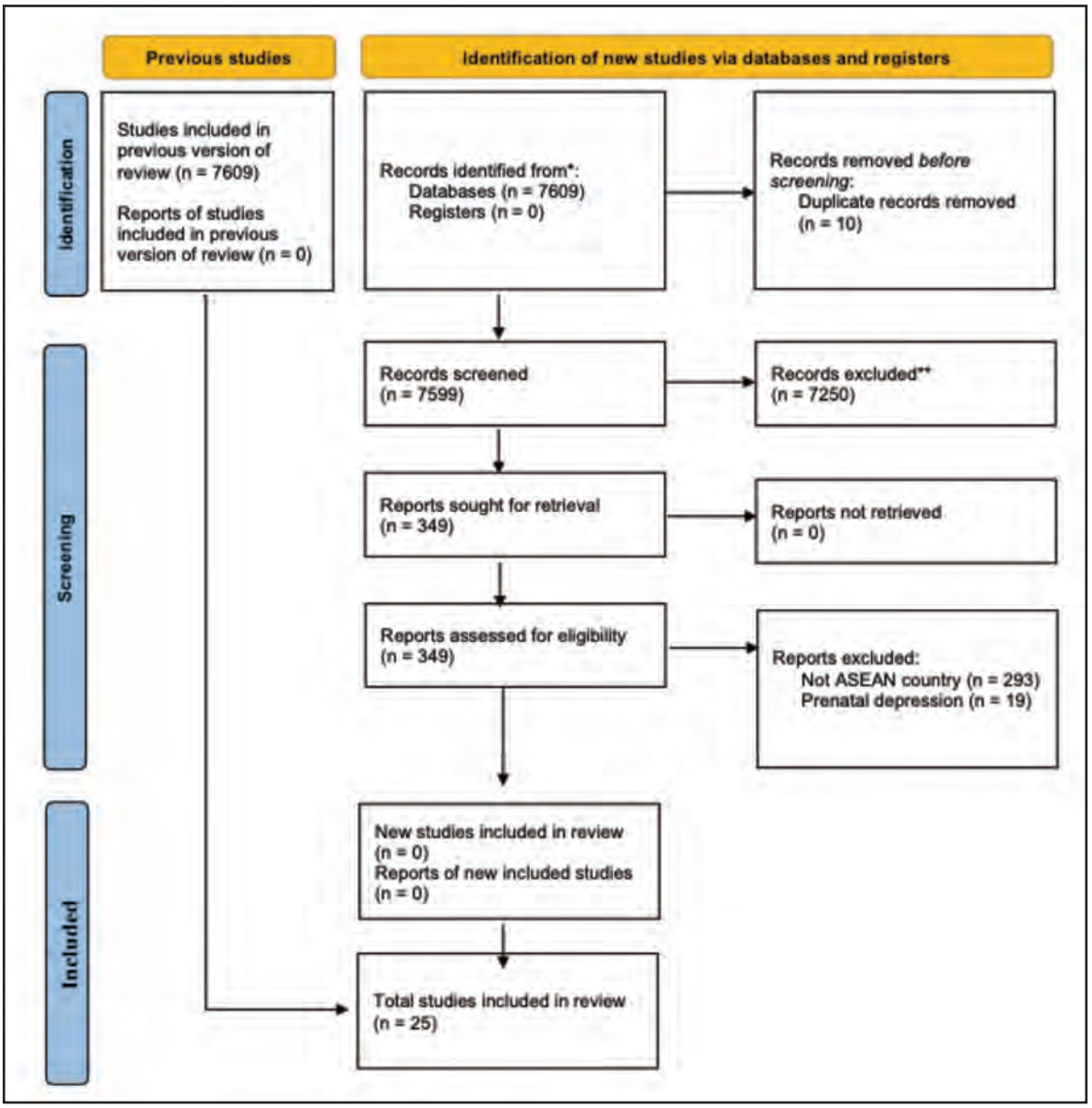

Fig. 1: PRISMA flow diagram.

adjust for babysitting and transition into motherhood. Other than that, the possibility of hormone dysregulation following childbirth also contributes to the depression.[3]

From our study, we found four significant risk factors associated with PPD. There were unplanned pregnancy, term pregnancy, poor family support and physical violence. According to current study findings, women experiencing physical violence and lack or poor family support were at increased risk of PPD. In this situation, usually after delivery, the mother will go through a new phase and transition whereby the mother needs support from the family to help, teach and manage the newborn. Hence, if they had a lack of support from family members or experienced physical violence, it could aggravate women's condition and contribute to PPD. These findings were similar to various systematic reviews/meta-analysis as described below.[3,38–40]

According to a systematic review and meta-analysis on PPD and its association with adverse infant health outcomes in low- and middle-income countries,[3] a mother's stress and depression symptoms could be worsened by a lack of social support because it affects the mother's self-confidence. Sawyer et al.[38] highlighted in a systematic review of postnatal psychological well-being in Africa that women who have poor support and marital/family conflict were associated with depression. Domestic violence has been associated with perinatal mental disorders, including antenatal and PPD.[39] A systematic review and meta-analysis on domestic violence and perinatal mental disorders[39] highlighted that women with PPD reported a high prevalence and risk for intimate partner violence during the lifetime (OR 2.9, 95% CI 1.8–4.8), during the past year (OR 2.8, 95% CI 1.7–4.6) and during pregnancy (OR 4.4, 95% CI 2.9–6.5). These findings are consistent with our results that demonstrated poor family support and intimate physical violence was associated with PPD.

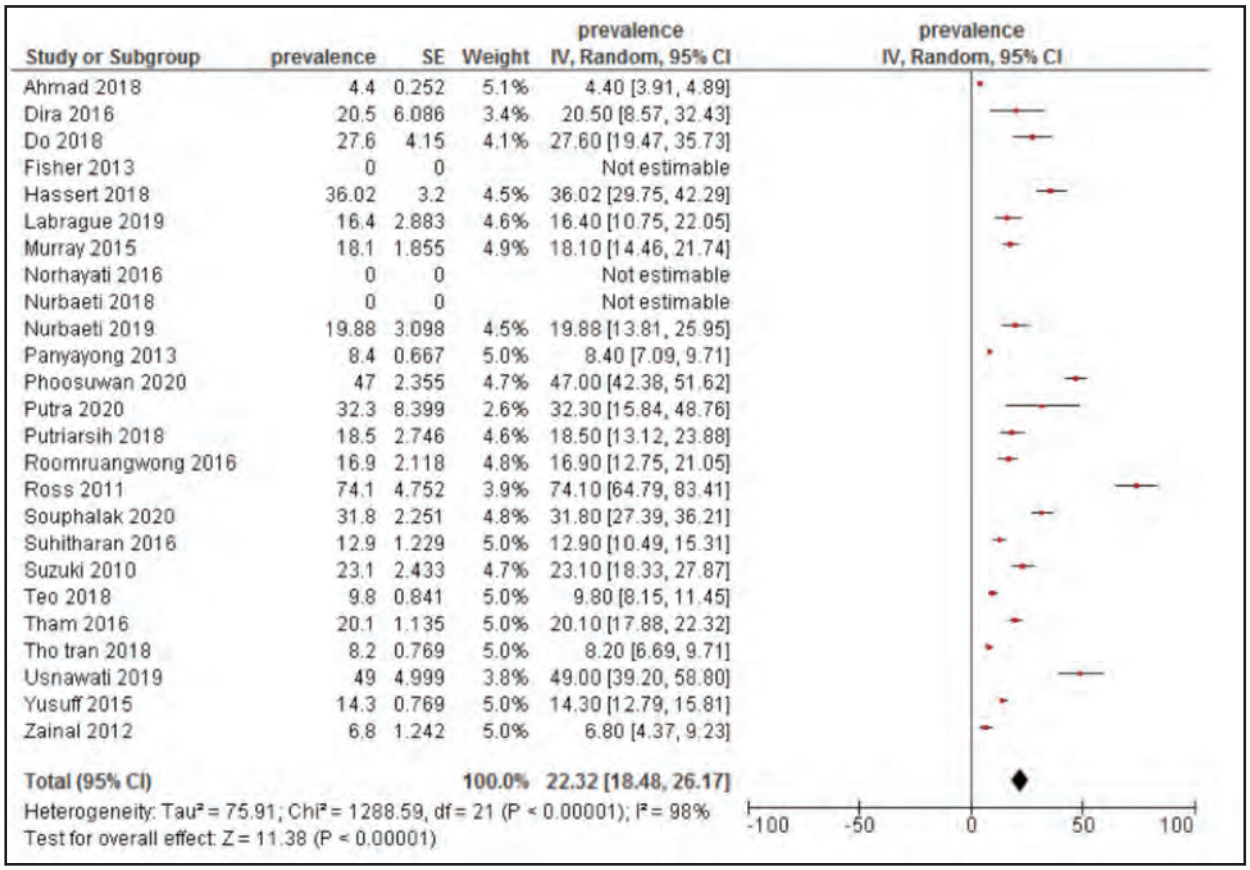

Fig. 2: Forest plot of the prevalence of PPD in ASEAN countries.

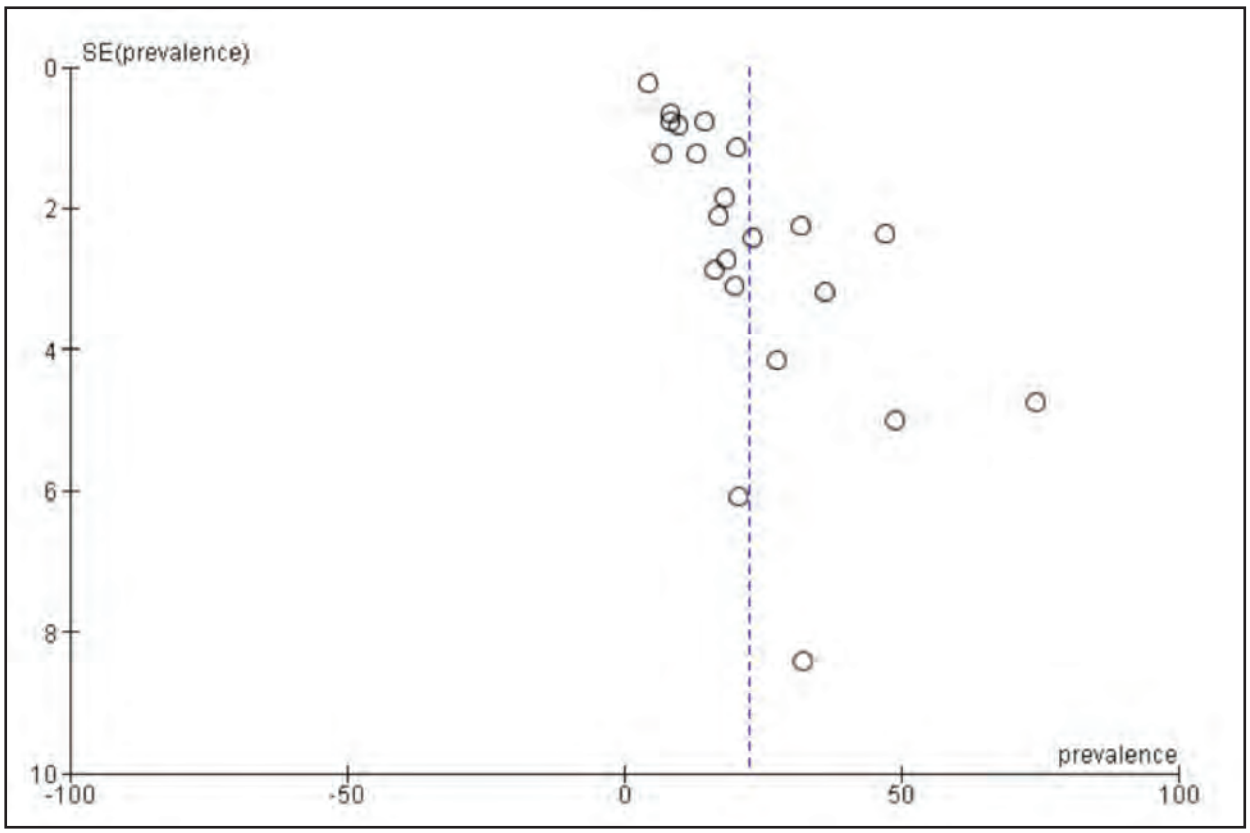

Fig. 3: Funnel plot for assessing publication bias.

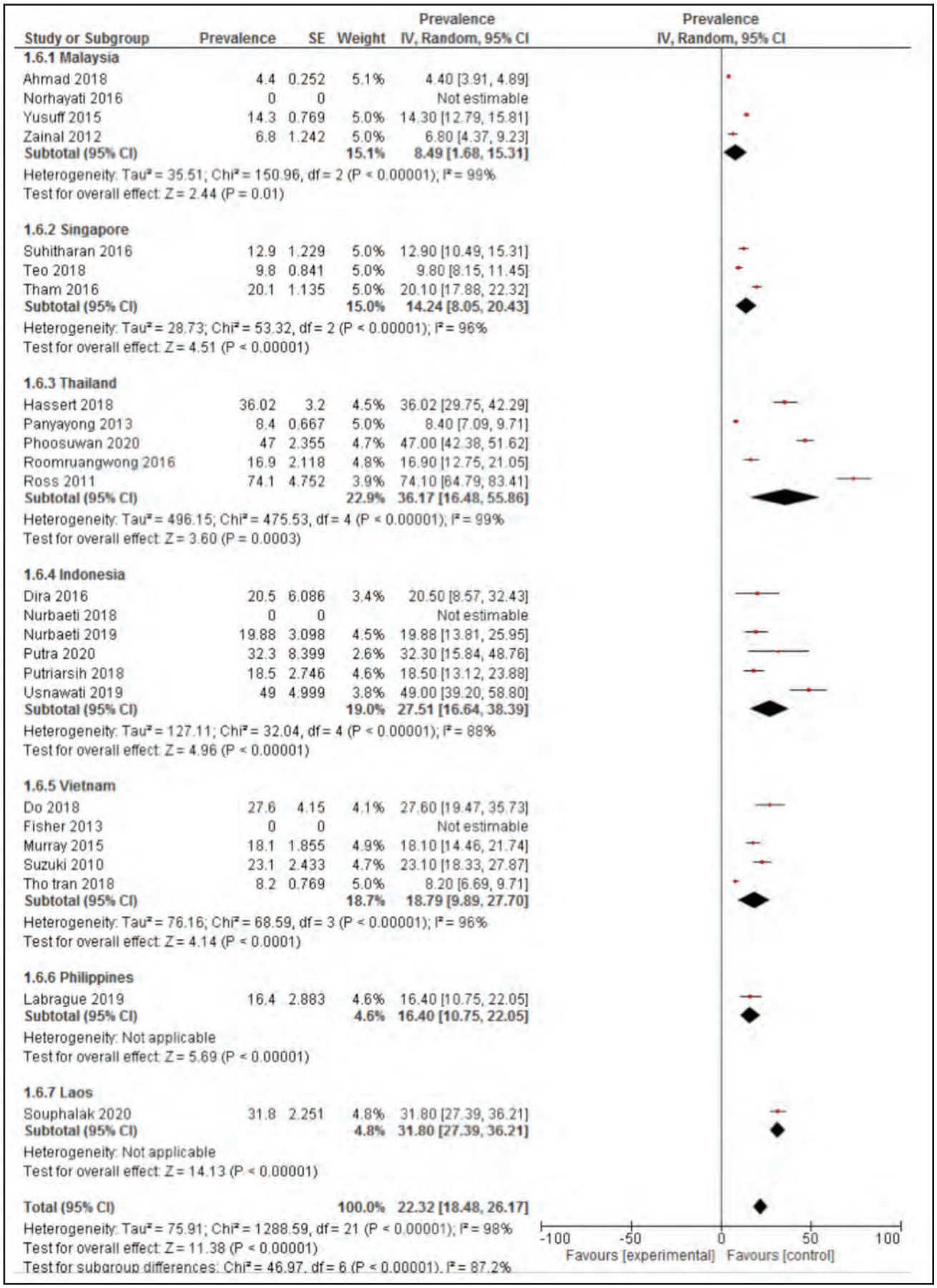

Fig. 4: Forest plot of a subgroup based on the countries for PPD.

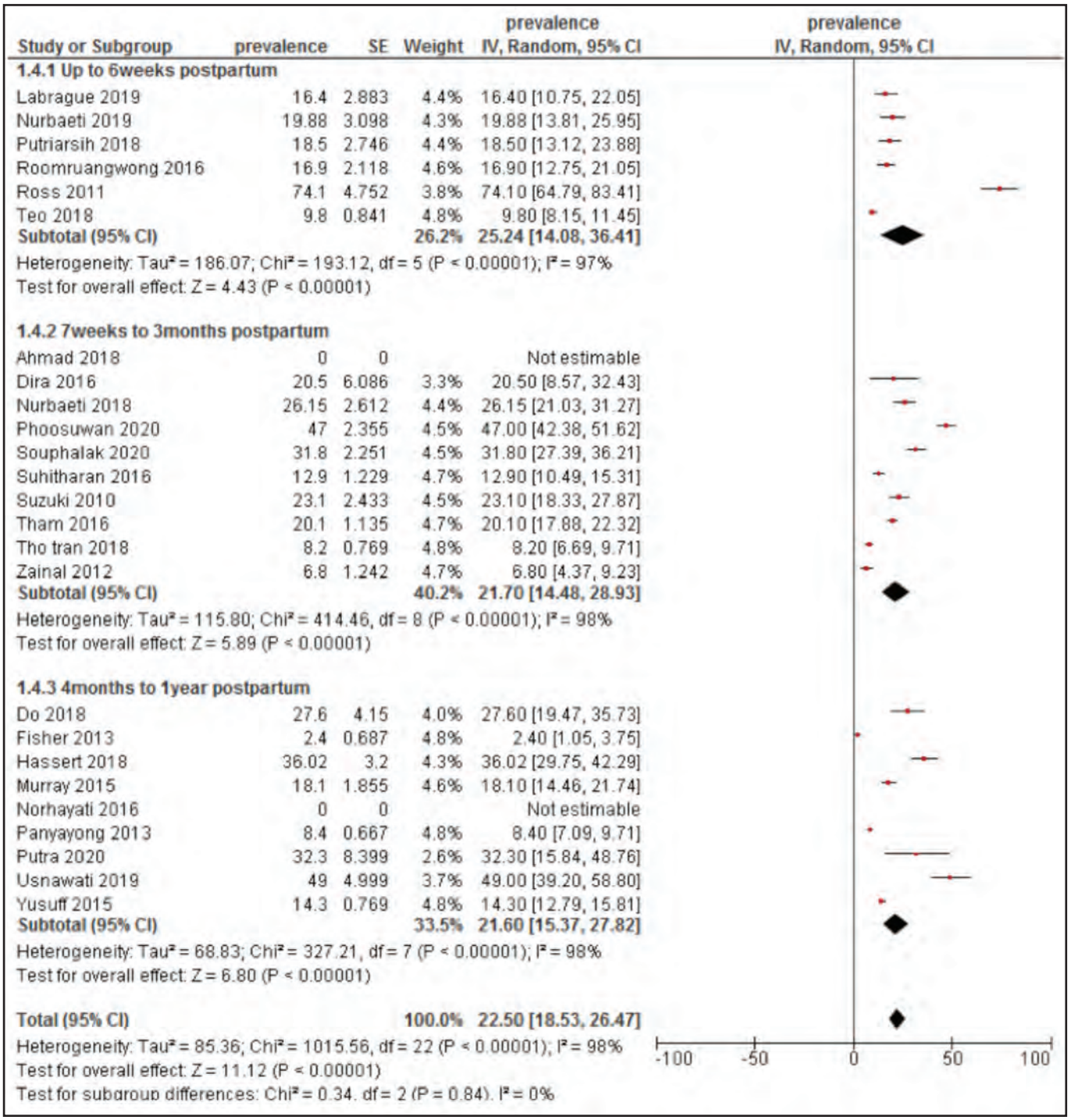

Fig. 5: Forest plot of the subgroup analysis based at different assessment time points for PPD.

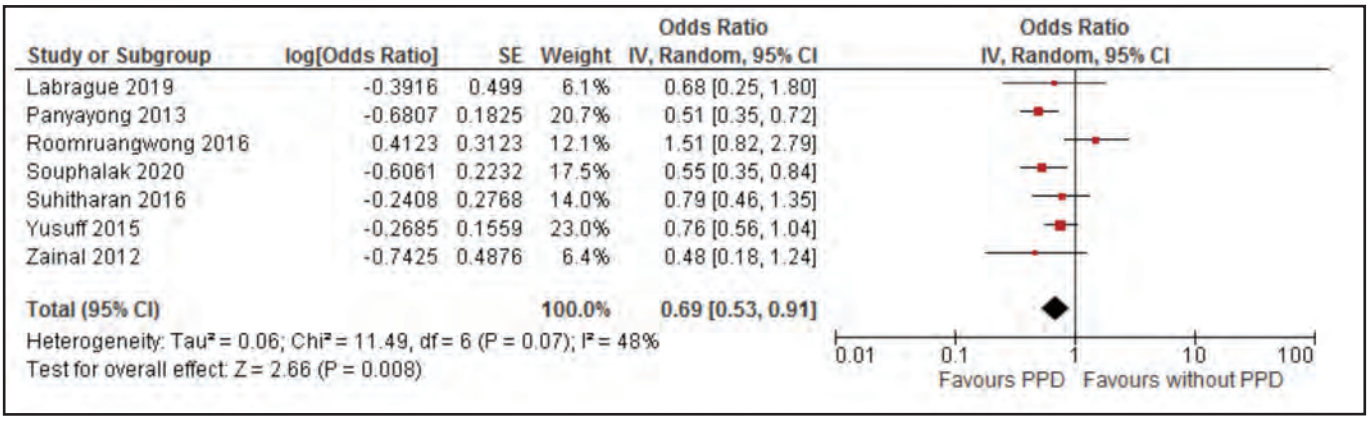

Fig. 6: Forest plot for association between unplanned pregnancy and PPD.

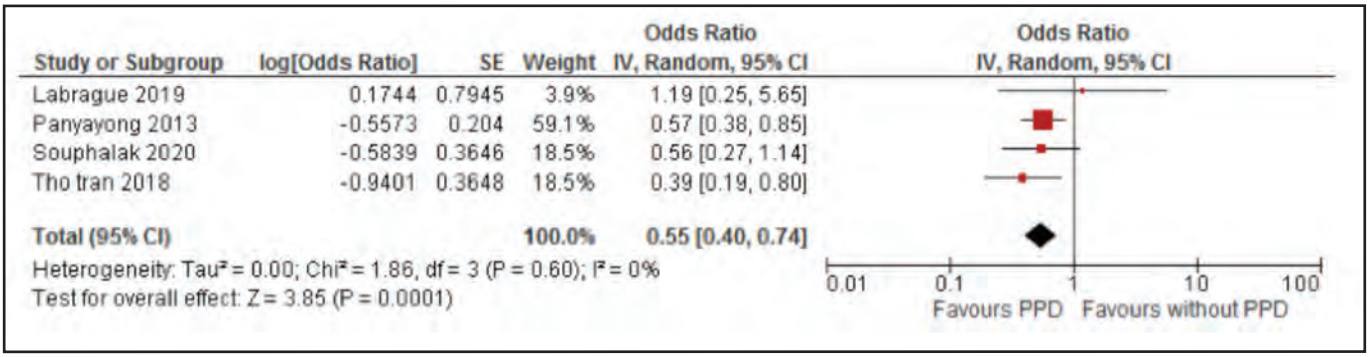

Fig. 7: Forest plot for association between term pregnancy and PPD.

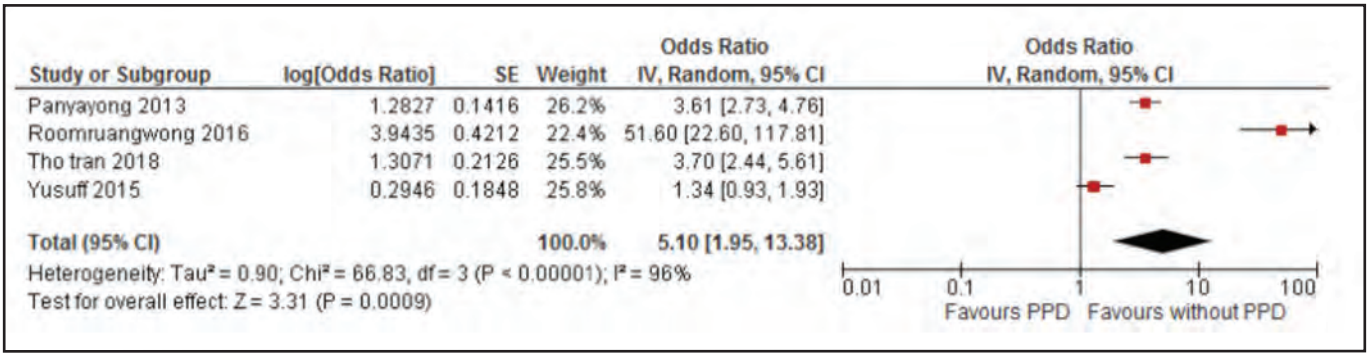

Fig. 8: Forest plot for association between poor family support and PPD.

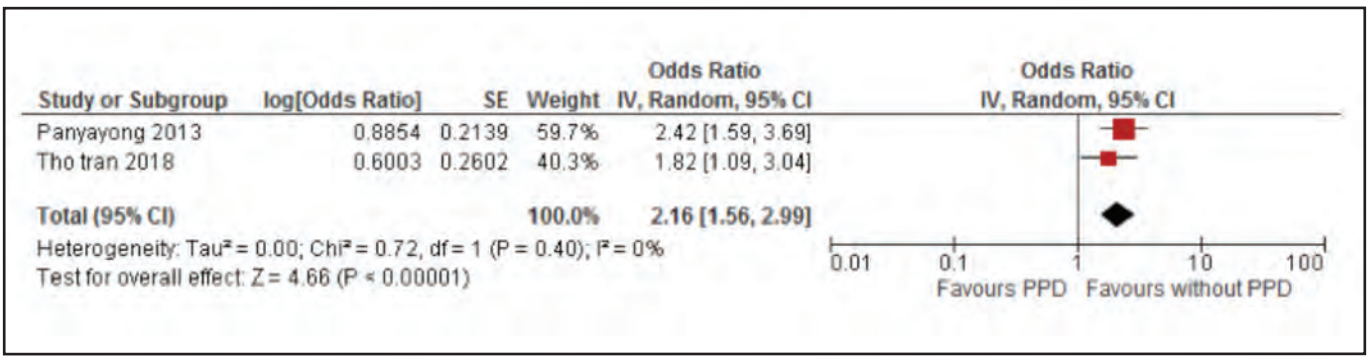

Fig. 9: Forest plot for association between physical violence and PPD.

For unplanned and preterm pregnancies, our study showed a lower risk of PPD and was in contrast with other studies,[3,4,40] whereby these risk factors favour PPD. This is probably due to the minimal study from ASEAN countries, different tools in PPD assessment method, a wide range of PPD assessment time, greater variety of sample size and cultural and background factors.

Based on the measurement tools used for diagnosis of PPD, about 84% of included studies used EPDS, whereas 16% used different diagnostic tools: MINI, DSM-IV, CES-D and Case-Finding Instruments for Depression. Out of 84%, eight studies[11,17,18,24,25,33,35,36] used validated EPDS, five studies[14,27,28,34,37] used back-to-back translation and another eight studies[8,20,21,23,26,29–31] not mentioned about validation of EPDS. All this has a significant impact on the result because of the considerable disparities, and the result is difficult to interpret. Furthermore, different cut-off points for EPDS also significantly impacted the result. According to Levis et al.[40] a cut-off value of 11 or higher showed maximised sensitivity and specificity, and 12 of the included studies[11,14,17,18,20,23,24,27,28,30,34,36] using cut-off point ≥11.

More research on PPD would be beneficial in identifying postnatal depression in mothers as soon as possible after giving birth and acting immediately to prevent morbidity, death, disabilities and negative impacts on the child's future development. This is especially crucial for the development of maternal health care in ASEAN countries. Aside from that, this research is limited to papers published in English and limited studies about PPD in ASEAN countries.

CONCLUSION

The prevalence of PPD in ASEAN countries was 22.32%. Unplanned and term pregnancies lower the risk of PPD, while poor family support and women who have experienced physical violence increase the risk of PPD. This review also found a very limited study among ASEAN countries and a scarcity of high-quality studies in ASEAN that can be used to generate generalisability evidence. More studies are needed to assess this problem's magnitude and plan a proper intervention program. Apart from that, the findings can be used to identify the need for early detection, encourage the development of an intervention to reduce its occurrence and support mothers with PPD.

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