

Associations between Unplanned Pregnancy, Low Social Support, Domestic Violence, and Intrapartum Complication, with Postpartum Depression: Meta Analysis

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ABSTRACT

Background: The postpartum period is a period where the risk of depression and other mental disorders generally increases due to the physiological and psychosocial changes that occur. This study aimed to measure the relationship using the meta-analysis method of unplanned pregnancy, poor social support, domestic violence, complications during childbirth with the incidence of postpartum depression.

Subjects and Method: This was a systematic review and meta-analysis. Article searches were carried out using PICO. Population: Postpartum women. Interventions: unplanned pregnancy, poor social support, domestic violence, and complications during childbirth. Comparison: planned pregnancy, good social support, no domestic violence, and no complications during childbirth. Outcome: Postpartum depression. The keywords used in the article search were "postpartum depression" AND "unplanned pregnancy" AND "poor social support" AND "intimate partner violence" AND "delivery complications". Articles were obtained from several databases including Google Scholar, Pubmed, Science Direct from 2015-2023. Data is processed using the Review Manager Application (RevMan 5.3)

Results: Meta-analysis of 11 cross-sectional studies showed that unplanned pregnancy increased the risk of postpartum depression (aOR= 2.69; 95% CI= 2.30 to 3.16; p= 0.001). Meta-analysis of 11 cross-sectional studies showed that low social support increased the risk of postpartum depression (aOR= 2.35; 95% CI= 1.46 - 3.79; p= 0.004). Meta-analysis of 7 cross-sectional studies showed that partner violence increased the risk of postpartum depression (aOR= 2.82; 95% CI= 1.81 - 4.40; p= 0.001). Meta-analysis of 6 cross-sectional studies showed that complications during delivery increased the risk of postpartum depression (aOR= 2.20; 95% CI= 1.75 to 2.77; p= 0.001).

Conclusion: Unplanned pregnancies, poor social support, partner violence, and complications during childbirth increase the risk of postnatal depression.

Keywords: unplanned pregnancy, social support, partner violence, postpartum depression.

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BACKGROUND

The postnatal period is a period where the risk of depression and other mental disorders tends to increase due to the physiological and psychosocial changes that occur during pregnancy (Biaggi et al., 2016). Depression after giving birth is characterized by signs such as decreased quality of life, negative thoughts about the baby, decreased self-esteem and interest, feelings of sadness, guilt, anxiety, feeling that there is no value in caring for the baby, sleep disturbances, and problems in eating patterns (Khalida et al. 2016). The incidence rate of postpartum depression in developed countries ranges from 10% to 15% in the first year after giving birth (Faisal et al., 2013). The incidence of postnatal depression tends to be higher in low and middle income countries, compared to high income countries (Woody et al., 2017).

Unplanned pregnancy is one of the factors that influences postpartum depression. These conditions often create additional stress during pregnancy and postpartum, which can contribute to the development of postpartum depression (Vaezi et al., 2019). Unplanned pregnancy is associated with an increased risk of poor birth outcomes as well as disorders of the mother's emotional mental health (Abajobir et al., 2016).

Social support has been shown to be a factor in the risk of major depression, with a lack of support leading to increased symptoms and levels of depression (Cho et al., 2022). The types of social support that are most widely considered are emotional support and instrumental support (Reid et al., 2015).

Verbal and physical violence influences postnatal depression. Globally, it is estimated that the incidence of emotional violence against pregnant women ranges from 8% to 78%, while physical violence ranges from 4% to 39% (Roghatii et al., 2017). Partner verbal and physical abuse during pregnancy was

significantly associated with postpartum depression after adjusting for possible confounders (Miura et al., 2017).

Some women may experience symptoms of postpartum depression related to complications during childbirth. Previous research examining the incidence of maternal and infant health problems in hospitals in the United States, reported that the complication rate reached 12.9% in women who gave birth naturally, 19.7% in women who underwent cesarean section, while the complication rate in newborns reached 20.2% (Huennekens et al., 2020).

Based on the explanation above, this study aims to analyze the factors of unplanned pregnancy, poor social support, violence by partners, and complications during childbirth with postpartum depression disorder using meta analysis.

SUBJECTS AND METHOD

1. Study Design

This research was conducted using articles published between 2015 and 2023. Article selection was carried out using the PRISMA flow diagram. The keywords used in the article search were "postpartum depression" AND "unplanned pregnancy" "poor social support" AND "intimate partner violence" AND "delivery complications".

2. Steps of Meta-Analysis

The steps taken in this research are:

- 1) Formulate research questions in determining PICO.
- 2) Search for primary study articles in the data base
- 3) Assess the quality of the study
- 4) Analyze quantitatively
- 5) Draw conclusions

3. Inclusion Criteria

The article used is full text, cross-sectional design, in English, published between 2015 – 2023, the article analyzes the presence of risk factors for postpartum depression and at the

end of the study is reported using the adjusted odds ratio (aOR).

4. Exclusion Criteria

In this study, articles that have conducted meta-analysis, are not cross-sectional in design, do not report study outcomes using adjusted odds ratios (aOR), and have samples of less than 100 participants will be excluded.

5. Operational Definition of Variable

Unplanned Pregnancy was a situation where a woman becomes pregnant without planning it or without the intention to have children at that time.

Social Support was an important aspect of a person's social and psychological life, and it is important to seek healthy and positive social support when needed.

Violence by a Partner was behavior that is detrimental or harmful, whether open (overt) or covert (covert), as well as behavior that is offensive.

Complications During Childbirth was childbirth complications can include a variety

of health problems that arise during pregnancy, labor, or post-partum.

6. Instrument

Quality assessment in this study used a critical appraisal sheet for cross-sectional studies published by Murti in 2023.

7. Data Analysis

The data that has been collected will be processed using the Review Manager Application (RevMan 5.3) released by the Cochrane Collaboration. The data processing process involves calculating effect sizes and evaluating heterogeneity.

RESULTS

The process of searching for articles which were then synthesized and processed the data in this meta-analysis research was carried out by searching several journal databases, including Google Scholar, PubMed, Science Direct. During the review and article selection stages, the use of the PRISMA FLOW flow diagram can be seen in Figure 1.

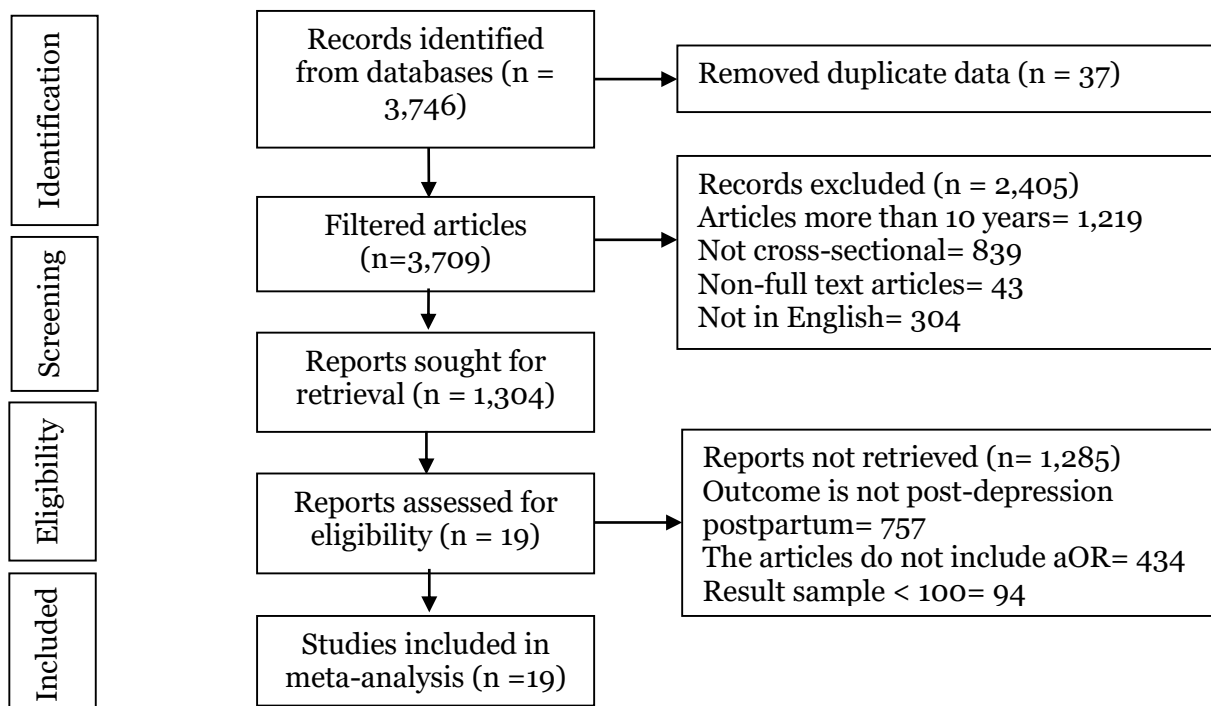


Figure 1. Results of PRISMA flow diagrams of associations between unplanned pregnancy, low social support, domestic violence, and intrapartum complication, with postpartum depression

In research relating to risk factors related to the topic of the relationship between unplanned pregnancy, poor social support, domestic violence, complications during childbirth and the incidence of postpartum depression, initially a search was carried out on 19 articles. After removing duplicate articles, 3709 articles remained. Then, through the process of checking the relevance of the title and research design, the number of relevant articles became 1304 articles. Next, these articles were analyzed according to inclusion and exclusion criteria, and finally 19 articles were selected.

From the articles that had been screened, a research quality assessment was carried out, and the result was that there were 19 articles that met the research quality assessment standards and would be included in the quantitative synthesis using meta-analysis.

From Figure 2, it can be seen that this research comes from three continents, namely Asia, Africa and Europe. There are 12 articles originating from the African continent, specifically from 8 Ethiopia, 1 Mozambique, 1 Eritera, 1 Uganda, 1 Ghana. Then 7 articles from the Asian continent, namely from India 2, Saudi Arabia 2, Myanmar 1, Khazaqstan 1, Malaysia 1.

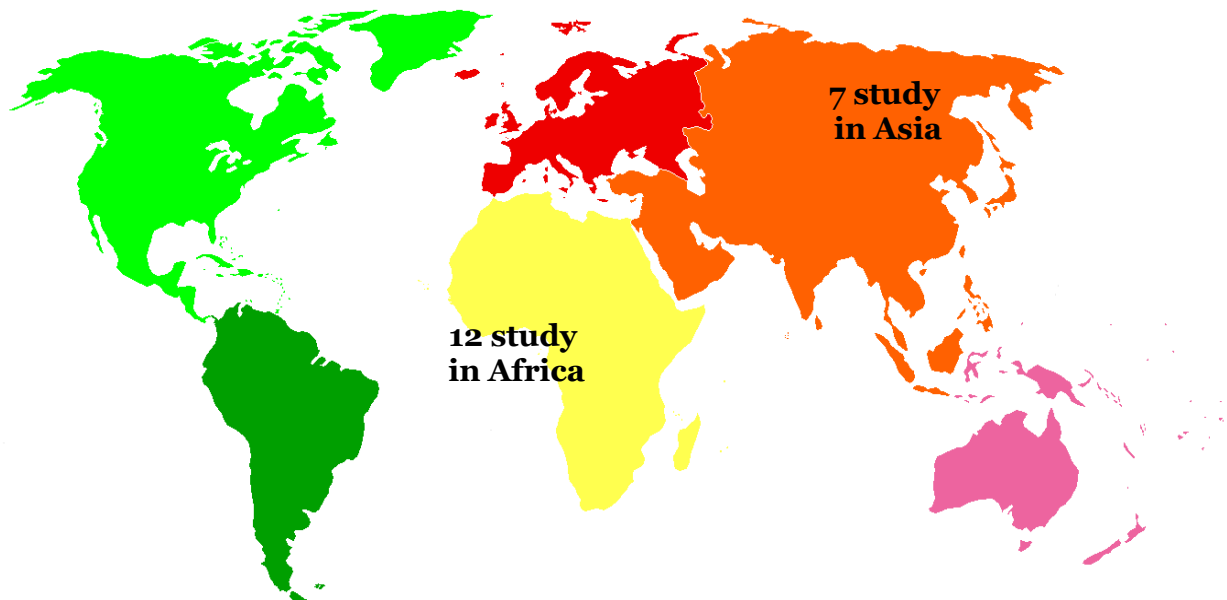


Figure 2. Research distribution map of associations between unplanned pregnancy, low social support, domestic violence, and intrapartum complication, with postpartum depression

Table 1. Critical appraisal of cross-sectional studies in meta-analysis research

Author (Year)	Appraisal Criteria												Total	
	1a	1b	1c	1d	2a	2b	3a	3b	4	5	6a	6b		7
Ahmad et al. (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Toru et al. (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Shitu et al. (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Lanjewar et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Necho et al. (2020)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Abebe et al. (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Audet et al. (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26

Author (Year)	Appraisal Criteria													Total
	1a	1b	1c	1d	2a	2b	3a	3b	4	5	6a	6b	7	
Alshahrani et al. (2023)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Kerie et al. (2017)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Kabede et al. (2022)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Abadiga et al. (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Gebregziabher et al. (2020)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Asaye et al. (2020)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Azale et al. (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Atuhaira et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Abenova et al. (2022)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Myo et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Agarwala et al. (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Daliri et al. (2023)	2	2	2	2	2	2	2	2	2	2	2	2	2	26

Description of Question Criteria

1. Formulation of research questions in the acronym PICO

- Is the population in the primary study the same as the population in the PICO meta-analysis?
- Is the operational definition of exposure/intervention in the primary study the same as the definition intended in the meta-analysis?
- Is the comparison used in the primary study the same as that planned in the meta-analysis?
- Are the outcome variables examined in the primary study the same as those planned in the meta-analysis?

2. Methods for selecting research subjects

- Descriptive cross-sectional study (prevalence): Was the sample randomly selected?
- Analytical descriptive cross-sectional study: Whether the sample was selected randomly or purposively

3. Methods for measuring comparison (intervention) and outcome variables (outcome)

- Are the exposure/ intervention and outcome variables measured with the same instruments (measuring tools) in all primary studies?

- If the variable is measured on a categorical scale, are the cutoffs or categories used the same across primary studies?

4. Design-related bias

- What is the Repo Rate?
- Is Non Response related to outcome?

5. Methods for controlling confusion

- Is there any confusion in the results/ conclusions of the primary study?
- Have primary study researchers used appropriate methods to control the influence of confounding

6. Statistical analysis methods

- In cross-sectional studies, is a multivariate analysis carried out?
- Multivariate analysis includes multiple linear regression, multiple logistic analysis, Cox regression analysis
- Does the primary study report effect sizes or associations resulting from multivariate analysis (e.g. adjusted OR, adjusted regression coefficient)

7. Conflict of interest

Is there a conflict of interest with the research sponsor?

Description of answer score:

- If there is a conflict of interest, give a value of "0".
- If there is no conflict of interest, give a value of "2".
- If in doubt, rate "1"

Table 2. Summary of cross-sectional study of associations between unplanned pregnancy, low social support, domestic violence, and intrapartum complication, with postpartum depression: (n=17,852)

Author (Year)	Country	Sample	Intervention	Comparison	Outcome
Ahmad et al. (2018)	Malaysia	5727	Intimate Partner violence Lack of family support during confinement	Non-Intimate Partner violence Good of family support during confinement	Postnatal depression
Toru et al. (2018)	Ethiopia	460	Unplanned pregnancy Domestic violence	Planned pregnancy Non domestic Partner violence	Postpartum depression
Shitu et al. (2019)	Ethiopia	596	Poor social support Unwanted pregnancy Husband substance abuse Low social support	Good social support Wanted pregnancy Non-Husband substance abuse High social support	Postpartum depression
Lanjewar et al. (2021)	India	240	Low social support	High social support	Postpartum depression
Necho et al. (2020)	Ethiopia	378	Intimate partner violence Poor social support Unplanned pregnancy	Non-Intimate partner violence Good social support Planned pregnancy	Postpartum depression
Abebe et al. (2019)	Ethiopia	511	Intimate partner violence Unplanned for pregnancy	Non intimate Partner violence Planned for pregnancy	Postpartum depression
Audet et al. (2018)	Mozambique	3543	Zero social support	Social support	Depression postnatal
Alshahrani et al. (2023)	Saudi Arabia	228	Support by family	Non support by family	Postpartum depression
Kerie et al. (2017)	Saudi Arabia	138	Unplanned pregnancy	Planned pregnancy	Postpartum depression
Kabede et al. (2022)	Ethiopia	794	Planned pregnancy Poor social support	Planned pregnancy Strong social support	Postpartum depression
Abadiga et al. (2019)	Ethiopia	295	Husband / partner involvement Poor social support	Husband / partner non involvement Good social support	Postnatal depression
Gebregziabher et al. (2020)	Eritrea	380	Delivery complication Unplanned pregnancy Complications during pregnancy or childbirth	Non-Complication Planned pregnancy Non complications during pregnancy or childbirth	Postpartum depression
Asaye et al. (2020)	Ethiopia	526	Unplanned pregnancy No planned pregnancy	Planned pregnancy Planned pregnancy	Postpartum depression
Azale et al. (2018)	Ethiopia	3147	Postnatal Complication Poor social support	Non-Complication Strong social support	Postpartum depression

Author (Year)	Country	Sample	Intervention	Comparison	Outcome
Atuhaira et al. (2021)	Uganda	292	Low perceived social support	Adequate perceived social support	Postpartum depression
Abenova et al. (2022)	Kazakhstan	251	No planned pregnancy	Planned pregnancy	Depression postnatal
Myo et al. (2021)	Myanmar	220	Unplanned pregnancy	Planned pregnancy	Postpartum depression
Agarwala et al. (2019)	India	410	Labour Complications	Non-Labor Complications	Postpartum depression
Daliri et al. (2023)	Ghana	242	Domestic / Partner violence Obstetric complication	Non-Domestic / Partner violence Non-Obstetric complication	Postpartum depression

Table 3. AOR data on unplanned pregnancy on postpartum depression (n=9,816)

Author (Year)	aOR	95% CI	
		Lower Limit	Upper Limit
Ahmad et al. (2018)	3.32	2.35	4.69
Shitu et al. (2019)	1.95	1.14	3.33
Necho et al. (2020)	2.50	1.76	7.23
Abebe et al. (2019)	1.86	1.02	3.41
Kerie et al. (2017)	4.49	2.31	8.71
Kabede et al. (2022)	3.16	1.77	5.62
Abadiga et al. (2019)	7.84	3.19	19.26
Gebregziabher et al. (2020)	3.39	1.24	9.28
Asaye et al. (2020)	2.02	1.24	3.31
Abenova et al. (2022)	1.95	1.14	3.33
Myo et al. (2021)	2.94	1.30	6.67

a. Forest plot of correlation between unplanned pregnancy on postpartum depression

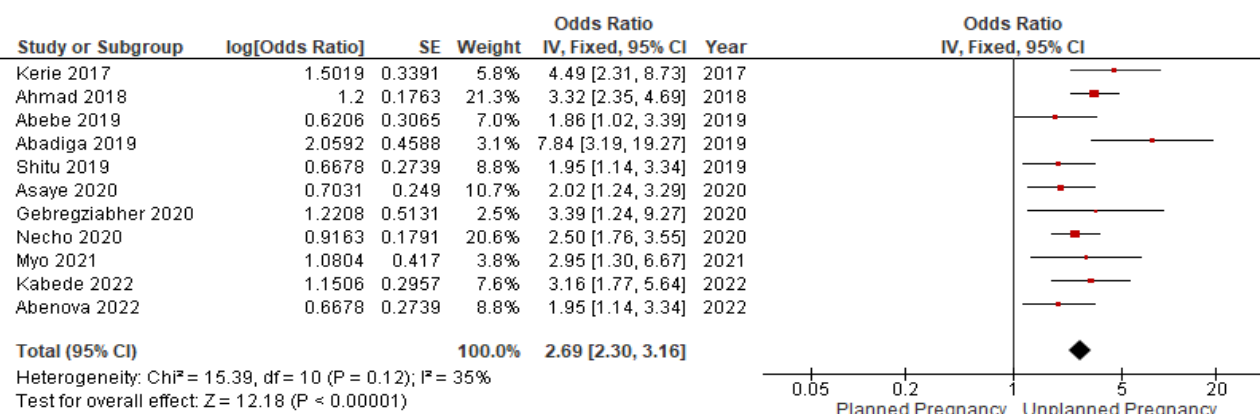


Figure 3. Forest plot of unplanned pregnancy on the incidence of postpartum depression

In Figure 3, the Forest Plot results show that mothers with unplanned pregnancies have a 2.69 times greater increase in postpartum depression compared with mothers with planned pregnancies, and these results are statistically significant (aOR= 2.69; 95% CI= 2.30 to 3.16; p= 0.001). The Forest Plot also

shows the heterogeneity of effect estimates between primary studies $I^2= 35\%$; $p= 0.120$, which means that the effect estimates between primary studies in this meta-analysis vary. Thus, the calculation of the average estimated effect is carried out using a fixed effect model approach.

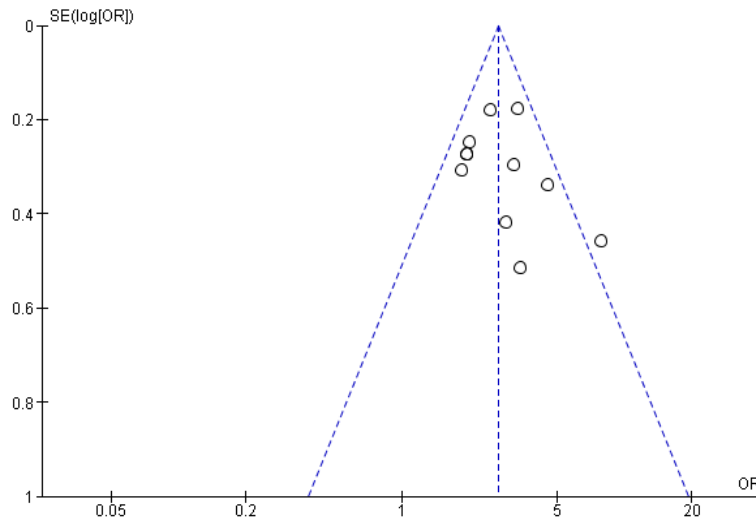


Figure 4. Funnel plot of association between unplanned pregnancy and postpartum depression

b. Funnel plot of association between unplanned pregnancy and postpartum depression

Figure 4 shows that the distribution of effect estimates from the primary studies of this meta-analysis lies more to the right of the vertical line of mean estimates than to the left, indicating publication bias. Because the

publication bias tends to be to the right of the average vertical line which is in the same direction as the diamond shape in the forest plot, the publication bias tends to overestimate the effect of mothers with unplanned pregnancies on postpartum depression (overestimate).

Table 4. AOR data of poor social support on postpartum depression (n= 15,700)

Author (Year)	aOR	95% CI	
		Lower Limit	Upper Limit
Ahmad et al. (2018)	1.79	1.12	4.69
Toru et al. (2018)	4.29	1.80	8.80
Shitu et al. (2019)	3.16	1.55	6.43
Lanjewar et al. (2021)	9.44	3.27	27.23
Necho et al. (2020)	0.58	0.24	1.44
Audet et al. (2018)	2.68	0.82	8.84
Alshahrani et al. (2023)	3.50	1.60	7.70
Kabede et al. (2022)	1.53	0.84	2.77
Abadiga et al. (2019)	6.59	2.25	19.29
Azale et al. (2018)	0.89	0.66	1.19
Atuhaira et al. (2021)	2.30	0.87	6.17

c. Forest plot of correlation between poor social support and postpartum depression

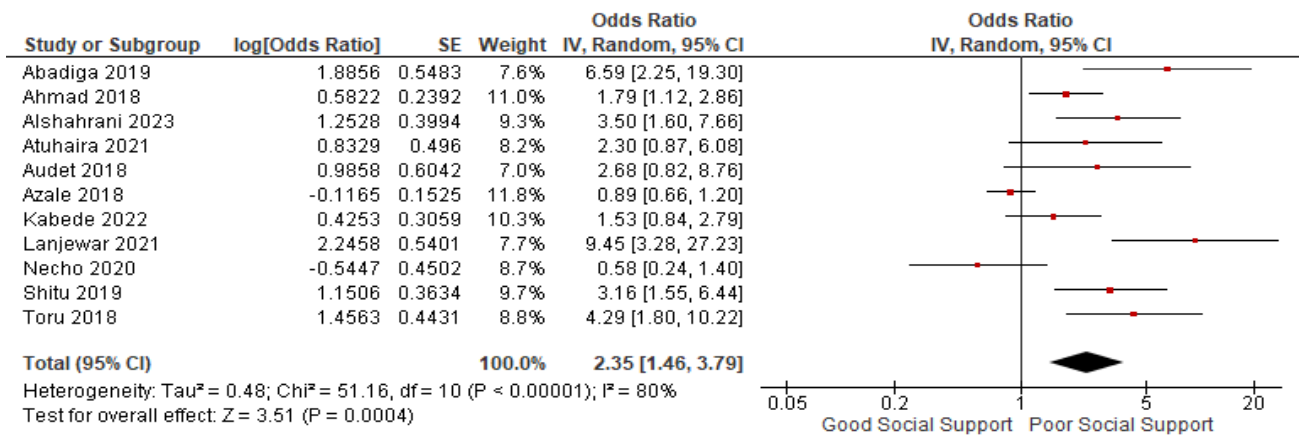


Figure 5. Forest plot of correlation between poor social support and postpartum depression

Based on Figure 5, it is explained that the Forest Plot results are statistically significant (aOR= 2.35; 95% CI= 1.46 to 3.79; p= 0.004). The Forest Plot also shows the heterogeneity of effect estimates between primary studies I²= 80%; p= 0.001.

Based on Figure 6, it shows that the distribution of effect estimates is much

located to the right of the vertical line of average estimates rather than to the left, which indicates that there is publication bias. Because the distribution to the right of the vertical line is the same as the location of the diamond shape to the right of the vertical line, the publication bias is to overestimate the true effect.

d. Funnel plot of correlation between poor social support and postpartum depression

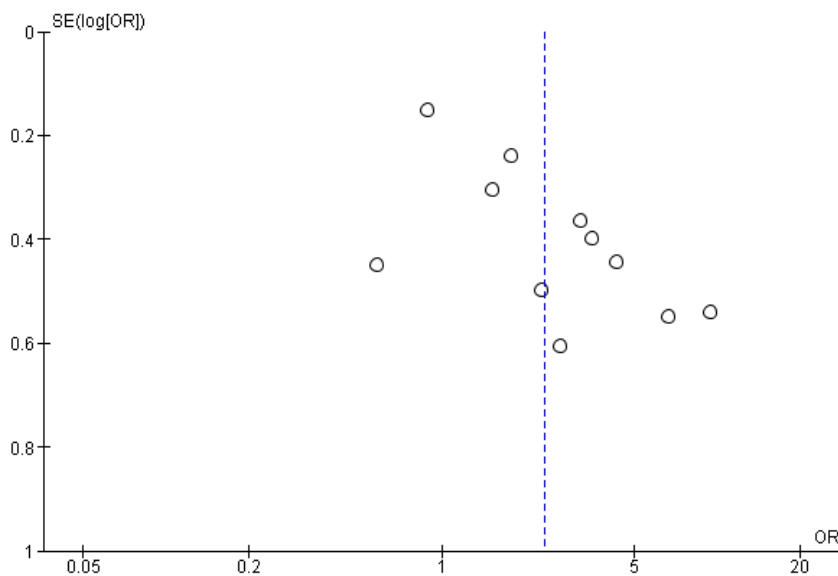


Figure 6. Funnel Plot of poor social support on the incidence of postpartum depression

The Forest Plot results in Figure 7 show that it is statistically significant (aOR= 2.82; 95% CI= 1.81 to 4.40; p= 0.001). The Forest Plot also shows the heterogeneity of effect

estimates between primary studies I²= 60%; p= 0.020, which means that the effect estimates between primary studies in this meta-analysis vary.

Tabel 5. aOR data of partner violence on postpartum depression (n=8,708)

Author (Year)	aOR (95% CI)	95% CI	
		Lower Limit	Upper Limit
Ahmad et al. (2018)	2.43	1.12	4.87
Toru et al. (2018)	2.86	1.78	8.80
Shitu et al. (2019)	1.09	0.61	1.96
Lanjewar et al. (2021)	6.50	1.98	15.85
Abebe et al. (2018)	3.16	1.76	5.67
Kabede et al. (2022)	5.92	2.44	14.40
Daliri et al. (2022)	3.10	0.78	12.21

e. Forest plot of correlation between domestic violence and postpartum depression

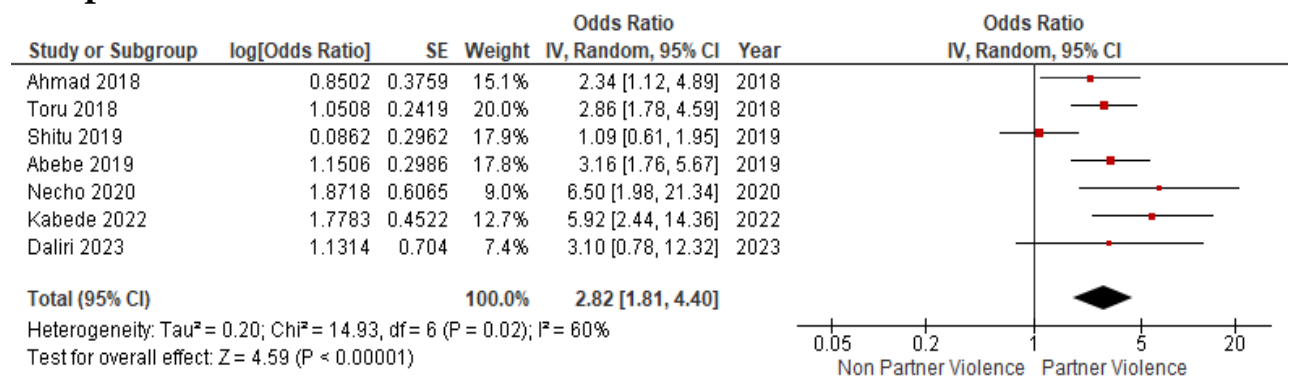


Figure 7. Forest plot of correlation between domestic violence and postpartum depression

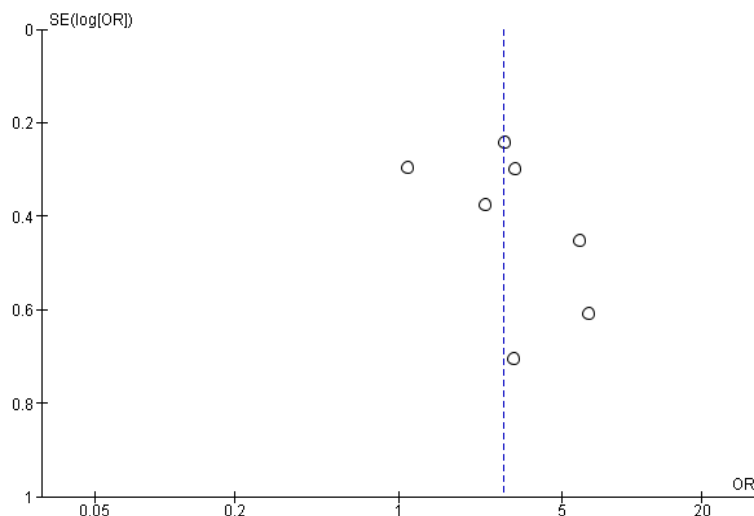


Figure 8. Funnel plot of correlation between domestic violence and postpartum depression

f. Funnel plot of correlation between domestic violence and postpartum depression

The Funnel Plot in Figure 8, shows that the distribution of effect estimates from the primary meta-analysis study is located more to the right of the vertical line of average estimates than to the left, which indicates there

is publication bias. Because the distribution of the funnel plot effect estimate is to the right of the average vertical line which is the same as the location of the diamond shape which is also to the right of the vertical line of the null hypothesis, the publication bias is to overestimate the true effect.

Table 6. AOR data complications of childbirth on postpartum depression (n= 5,700)

Author (Year)	aOR (95% CI)	95% CI	
		Lower Limit	Upper Limit
Shitu et al. (2019)	1.24	0.74	2.08
Abadiga et al. (2019)	3.02	0.77	11.74
Gebregziabher et al. (20120)	2.38	1.24	9.28
Azale et al. (2018)	2.43	1.80	3.29
Agarwala et al. (2019)	10.75	0.91	125.49
Daliri et al. (2022)	3.39	1.23	11.19

g. Forest plot of correlation between birth complications and postpartum depression

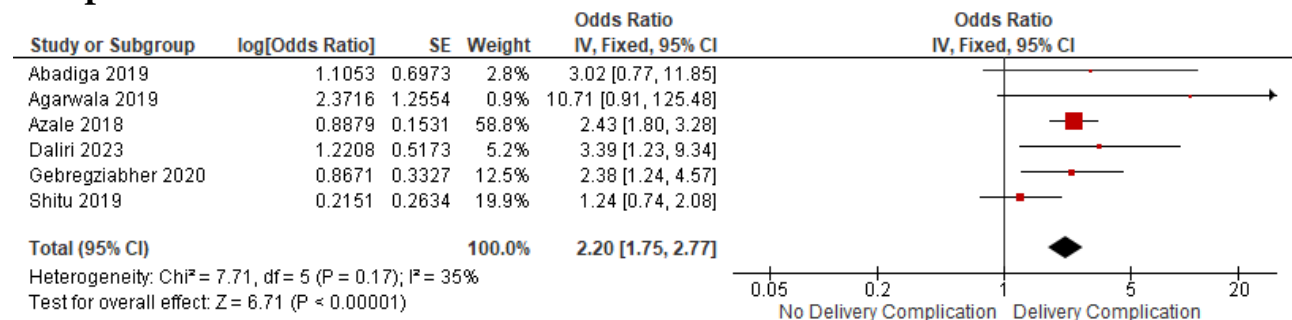


Figure 9. Forest Plot of birth complications on the incidence of postpartum depression

Based on Figure 9, the Forest Plot results show that mothers who experience complications in childbirth have a 2.20 times greater increase in postpartum depression compared to mothers who do not experience complications in childbirth, and these results are statistically significant (aOR= 2.20; 95% CI= 1.75 to 2.77; p= 0.001). The

Forest Plot also shows the heterogeneity of effect estimates between primary studies I²= 35%; p= 0.170, which means that the effect estimate between primary studies in this meta-analysis varies. Thus, the calculation of the average estimated effect is carried out using a fixed effect model approach.

h. Funnel plot of correlation between birth complications and postpartum depression

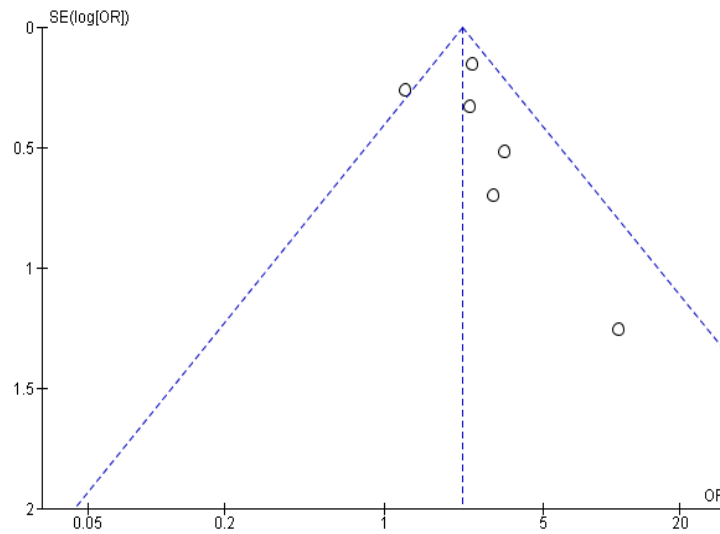


Figure 10. Funnel plot of correlation between birth complications and postpartum depression

Based on the Figure 10, it shows that the distribution of effect estimates from the primary meta-analysis study is located more to the right of the vertical line of average estimates than to the left, which indicates there is publication bias. Because the publication bias tends to be to the right of the average vertical line which is in the same direction as the location of the diamond shape in the Forest Plot, the publication bias tends to overestimate the effect of mothers experiencing complications in childbirth on postpartum depression (overestimate).

DISCUSSION

This research design uses a meta-analysis research design, and takes the theme, namely the Application of Health Science in covering the topic of the relationship between unplanned pregnancy, poor social support, domestic violence, complications during childbirth and the incidence of postpartum depression.

This research uses aOR statistical results from analyzes that aim to control confounding factors that can cause research

results to influence relationships or influence the population studied (Murthi, 2018). Then the data will be analyzed and processed using Revman 5.3, while the results of the systematic review of meta-analytic data are presented in Forest Plots and Funnel Plots.

1. Unplanned pregnancy and postpartum depression

This research shows in the Forest Plot that mothers with unplanned pregnancies have a 2.69 times greater increase in postpartum depression compared to mothers with planned pregnancies. Mothers who planned their pregnancies had a half lower risk of postpartum depression compared to those who experienced unplanned pregnancies (Asaye et al., 2020).

Other research also reveals that postpartum mothers with unplanned pregnancies have a 2.81 times risk of experiencing postpartum depression (aOR= 2.81; 95% CI= 1.36 to 4.82) (Lara et al., 2016).

2. Poor social support and postpartum depression

This research shows in the forest plot that mothers with poor social support have a 2.35 times greater increase in postpartum depression compared to mothers with good social support. The importance of social support in influencing mental health, including postpartum depression, is obtained from studies that focus on how individuals perceive this support (Keshia et al., 2015).

This is in line with the results of previous research which explains that mothers with poor social support will increase the risk of depression in postnatal mothers (aOR = 2.50; 95% CI= 1.25 to 4.50; $p < 0.05$) (Wedajo et al., 2023).

Other research also explains that low social support is more likely to be exposed to stress and experience symptoms of postpartum depression (aOR: 0.950; 95% CI= 0.932 to 0.968; $p < 0.001$) (Li et al., 2021).

3. Violence by partners and postpartum depression

This research shows in the Forest Plot that mothers who experience domestic violence have a 2.82 times greater increase in postpartum depression compared to mothers who do not experience domestic violence, and these results.

This was also explained in previous research that postpartum intimate partner violence greatly influences maternal depression during postpartum (aOR= 4.08; 95% CI= 1.95 to 8.54; $p < 0.05$) (Wedajo et al., 2023). Apart from that, it was also explained by other studies that physical intimate partner violence (OR= 5.80; 95% CI= 2.98 to 11.43) was significantly associated with postpartum symptoms (Mahenge et al., 2018).

4. Childbirth complications and postpartum depression

This research shows in the Forest Plot that mothers who experience complications in childbirth have a 2.20 times greater increase

in postpartum depression compared to mothers who do not experience complications in childbirth. This is in line with research which explains that there is a high risk of postpartum depression in mothers with birth complications (Tikmani et al., 2016).

This is in line with previous research that mothers with birth complications tend to have a high risk of postpartum depression (aOR= 2.55; 95% CI= 1.89 to 3.44) (Azale et al., 2018). Other research also explains that mothers experiencing complications during childbirth (aOR = 2.04; 95% CI= 1.05 to 3.95) tend to have a high risk of protective factors against postpartum depression.

AUTHOR CONTRIBUTION

Wulan Adis Aranti, Devi Indrawati, Sri Mulyani are the main researchers who chose the topic, explored and collected data, as well as analyzed the data and reviewed research documents. Etanaulia Marsim and Bhisma Murti played a role in guiding the writing of this research.

FUNDING AND SPONSORSHIP

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CONFLICT OF INTEREST

There was no conflict of interest in this study.

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