

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

Wulan Adis Aranti<sup>1)</sup>, Devi Indrawati<sup>1)</sup>, Sri Mulyani<sup>1)</sup>,  
Bhisma Murti<sup>1)</sup>, Etanaulia Marsim<sup>2)</sup>

<sup>1)</sup>Master's Program in Public Health, Universitas Sebelas Maret

<sup>2)</sup>Aisyah Pringsewu University, Lampung

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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.

### Correspondence:

Wulan Adis Aranti. Master's Program in Public Health, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java. Email: wulanaranti@gmail.com.

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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**

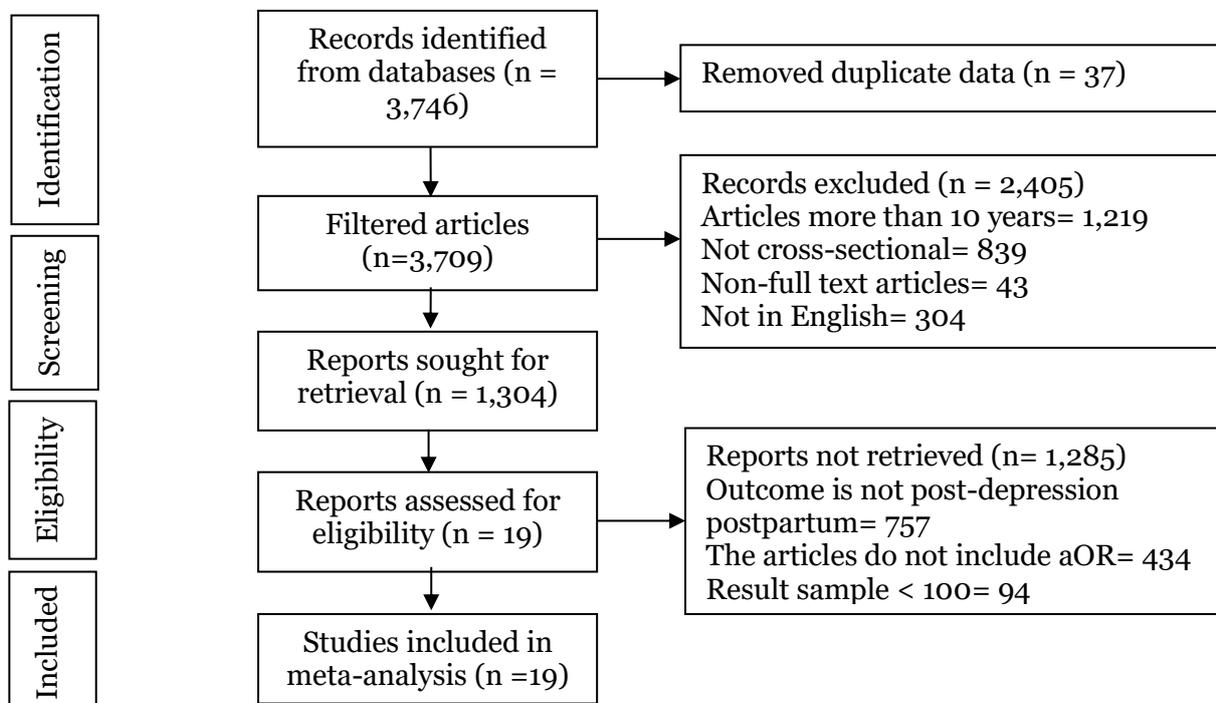
Quality assessment in this study used a critical appraisal sheet for cross-sectional studies published by Murti in 2023.

**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.

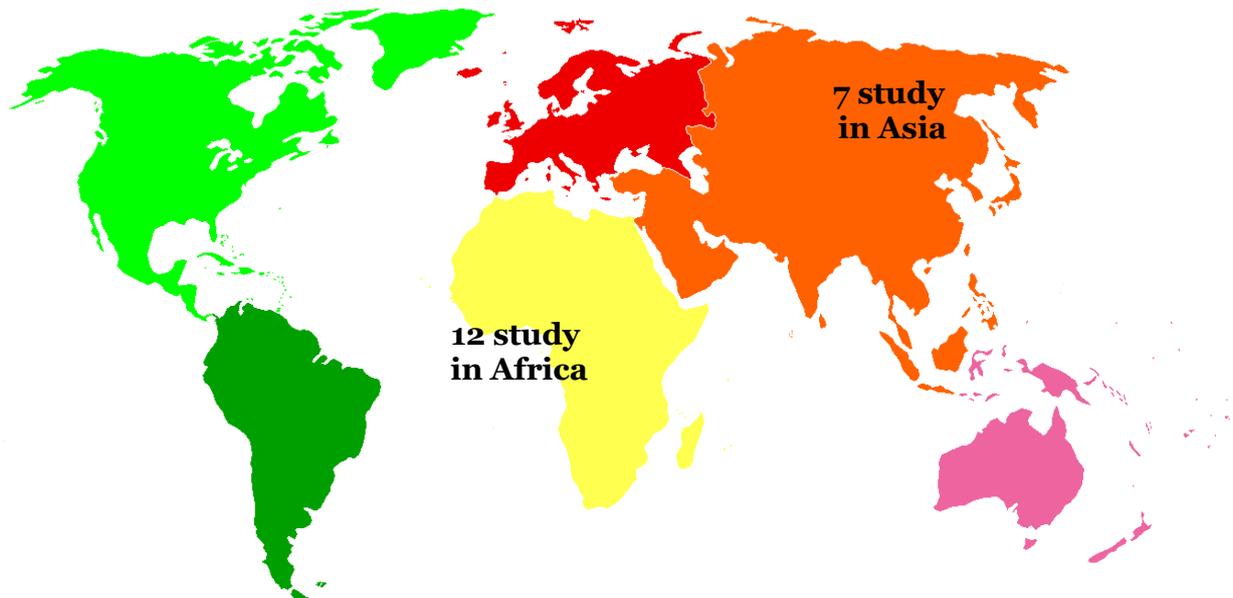


**Figure 1. Results of PRISMA flow diagrams of associations between unplanned pregnancy, low social support, domestic violence, and intrapartum complication, with postpartum depression**

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)**

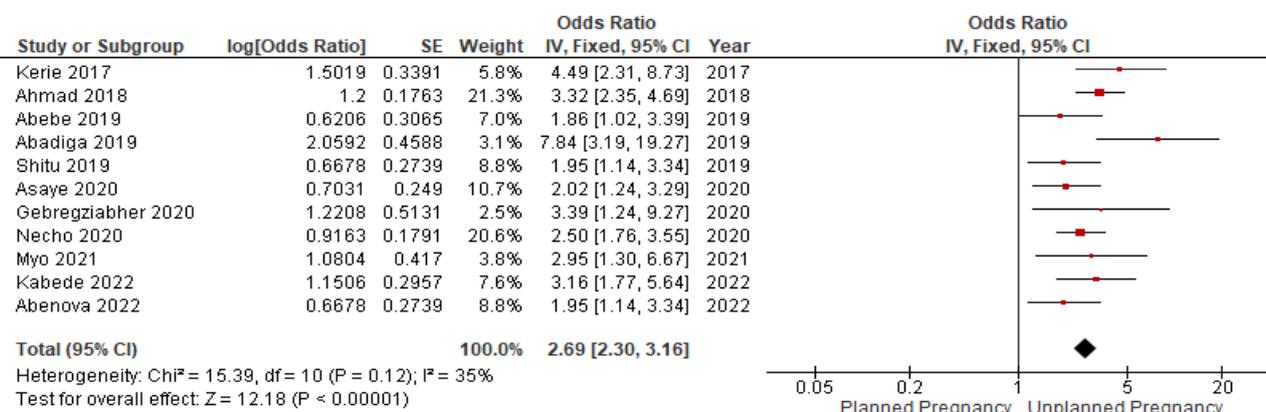
| Author (Year)               | Country      | Sample | Intervention   | Comparison  | Outcome               |
|-----------------------------|--------------|--------|--|---|-----------------------|
| Ahmad et al. (2018)         | Malaysia     | 5727   | Intimate Partner violence<br>Lack of family support during confinement                       | Non-Intimate Partner violence<br>Good of family support during confinement                    | Postnatal depression  |
| Toru et al. (2018)          | Ethiopia     | 460    | Unplanned pregnancy<br>Domestic violence   | Planned pregnancy<br>Non domestic Partner violence  | Postpartum depression |
| Shitu et al. (2019)         | Ethiopia     | 596    | Poor social support<br>Unwanted pregnancy<br>Husband substance abuse<br>Low social support   | Good social support<br>Wanted pregnancy<br>Non-Husband substance abuse<br>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<br>Poor social support<br>Unplanned pregnancy                      | Non-Intimate partner violence<br>Good social support<br>Planned pregnancy                     | Postpartum depression |
| Abebe et al. (2019)         | Ethiopia     | 511    | Intimate partner violence<br>Unplanned for pregnancy<br>Zero social support                  | Non intimate Partner violence<br>Planned for pregnancy<br>Social support                      | Postpartum depression |
| Audet et al. (2018)         | Mozambique   | 3543   |  |   | 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<br>Poor social support<br>Husband / partner involvement                    | Planned pregnancy<br>Strong social support<br>Husband / partner non involvement               | Postpartum depression |
| Abadiga et al. (2019)       | Ethiopia     | 295    | Poor social support  | Good social support   | Postnatal depression  |
| Gebregziabher et al. (2020) | Eritrea      | 380    | Delivery complication<br>Unplanned pregnancy<br>Complications during pregnancy or childbirth | Non-Complication<br>Planned pregnancy<br>Non complications during pregnancy or childbirth     | Postpartum depression |
| Asaye et al. (2020)         | Ethiopia     | 526    | Unplanned pregnancy<br>No planned pregnancy  | Planned pregnancy<br>Planned pregnancy  | Postpartum depression |
| Azale et al. (2018)         | Ethiopia     | 3147   | Postnatal Complication<br>Poor social support  | Non-Complication<br>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<br>Obstetric complication | Non-Domestic / Partner violence<br>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        |

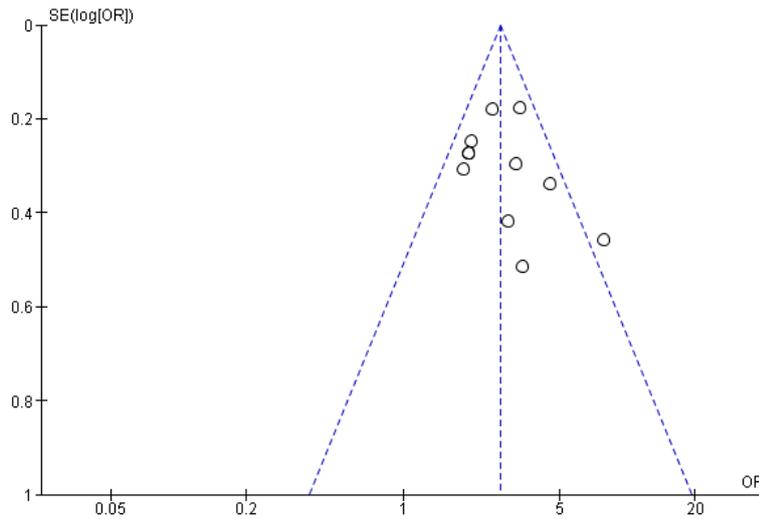
**a. Forest plot of correlation between unplanned pregnancy on postpartum depression**



**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**

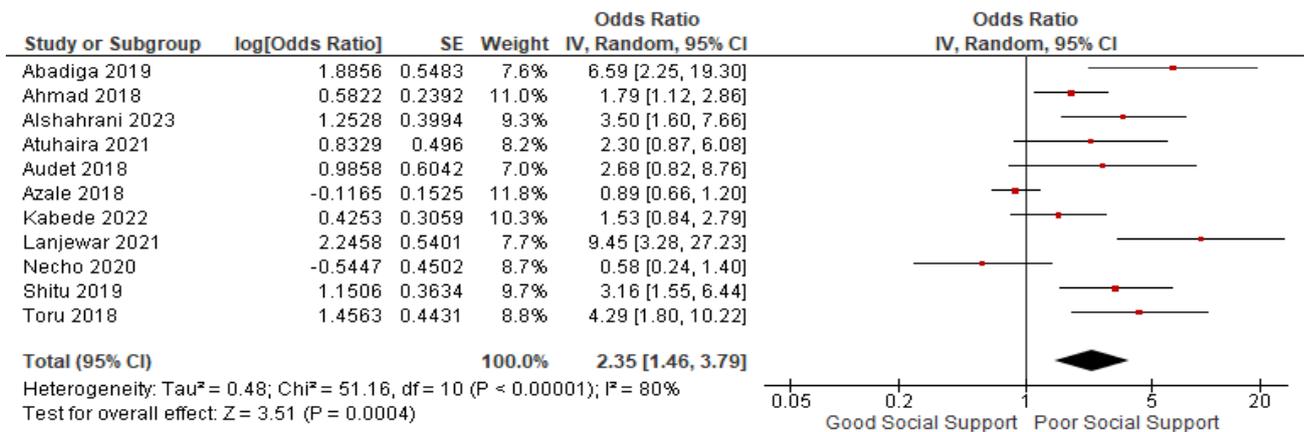
Figure 4 shows that the distribution of effect estimates from the primary studies of this meta-analysis lies more to the right of the vertical line of mean estimates than to the left, indicating publication bias. Because the

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**



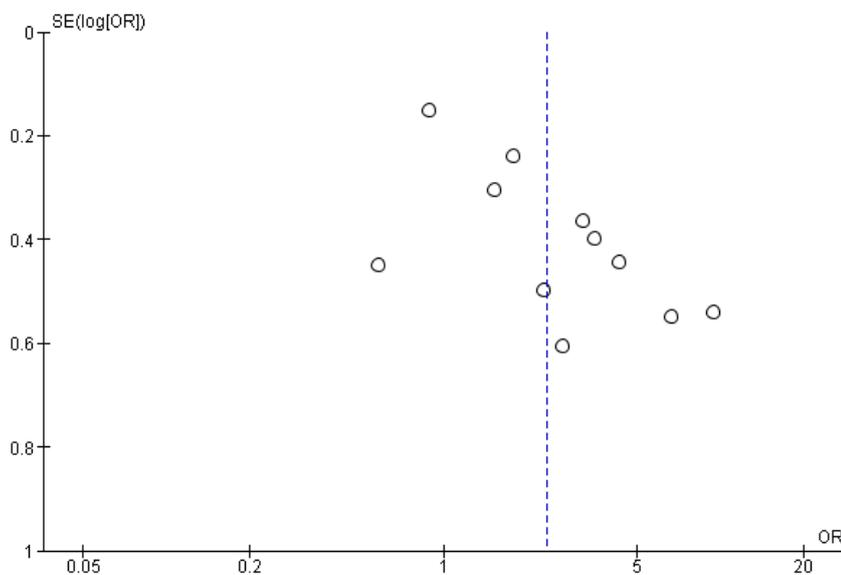
**Figure 5. Forest plot of correlation between poor social support and postpartum depression**

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 I<sup>2</sup>= 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**

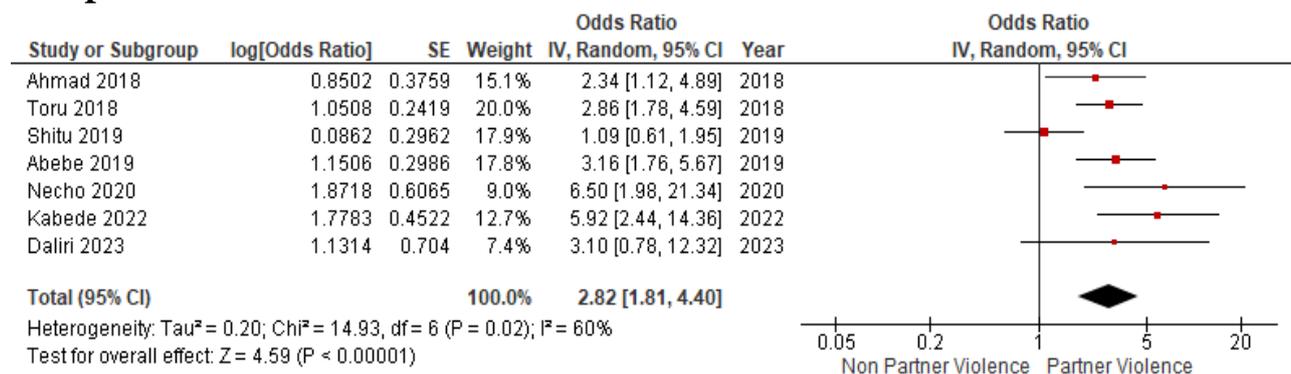
The Forest Plot results in Figure 7 show that it is statistically significant (aOR= 2.82; 95% CI= 1.81 to 4.40; p= 0.001). The Forest Plot also shows the heterogeneity of effect

estimates between primary studies I<sup>2</sup>= 60%; p= 0.020, which means that the effect estimates between primary studies in this meta-analysis vary.

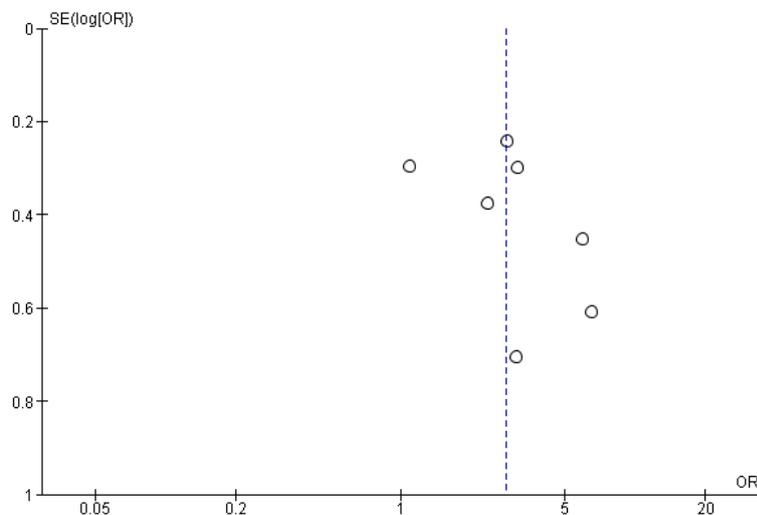
**Tabel 5. aOR data of partner violence on postpartum depression (n=8,708)**

| 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**

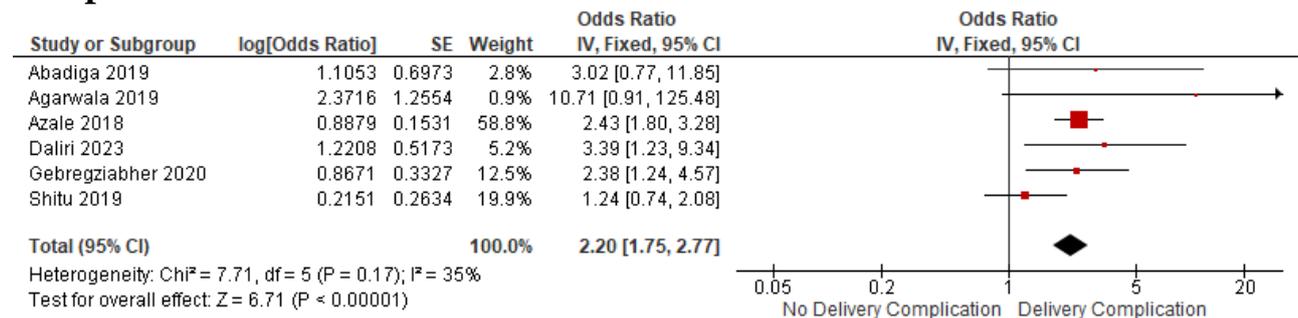
The Funnel Plot in Figure 8, shows that the distribution of effect estimates from the primary meta-analysis study is located more to the right of the vertical line of average estimates than to the left, which indicates there

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**

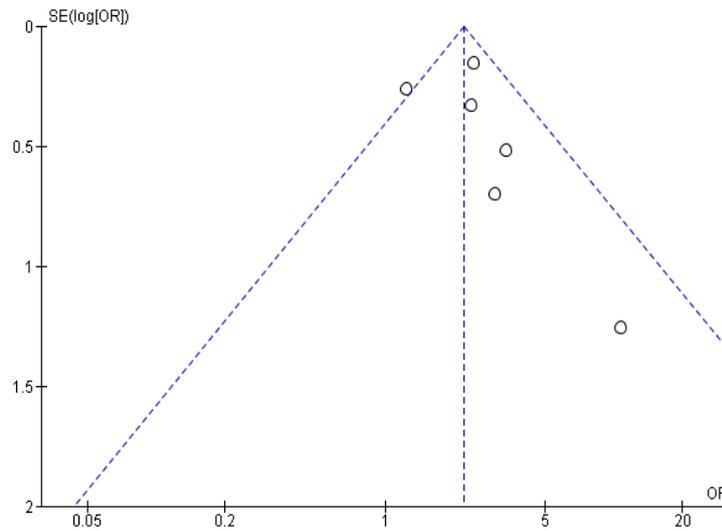


**Figure 9. Forest Plot of birth complications on the incidence of postpartum depression**

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 I<sup>2</sup>= 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.

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This study used personal funds.

## **CONFLICT OF INTEREST**

There was no conflict of interest in this study.

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