



Effects of domestic violence on antenatal depression: meta-analysis

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ABSTRACT

Antenatal depression or depression in pregnant women is influenced by various factors, one of which is the stressor of the social life of the household life, such as domestic violence. Domestic abuse during pregnancy has a negative impact on the mother's health as well as the newborn's and the child's development. The purpose of this study is to determine how much domestic violence affects antenatal depression. This study uses a meta-analytic study design from articles published from 2008 to 2022 using the Google Scholar, PubMed, Springer Link, and ScienceDirect databases. Articles are collected for 2 months by keywords ("Intimate Partner Violence" OR "IPV" OR "Domestic Violence") AND "Antenatal Depression" OR "Antepartum Depression" AND ("adjusted odds ratio" OR "multivariable"). The articles used are articles that meet the inclusion and exclusion criteria. There were 14 articles from 3 continents namely Asia, Africa, and North America with cross sectional and cohort study designs. Cross-sectional meta-analysis shows that domestic violence can increase the incidence of antenatal depression by 3.97 times compared by not experiencing domestic violence (aOR= 3.97; 95% CI= 2.44 to 6.47; p<0.001). Meanwhile, the cohort study showed that domestic violence can increase the incidence of antenatal depression by 2.58 times compared to not experiencing domestic violence (aOR= 2.58; 95% CI= 2.06 to 3.23; p<0.001). Total heterogeneity shows I² = 81%, such that it can be said that the data distribution is heterogeneous (random effect model). Domestic violence can increase the incidence of antenatal depression.

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1. Introduction

Depression is a mood disorder that causes feelings of sadness, interferes with thinking and hinders daily activities that occurs almost every day for at least 2 weeks [1]. World data shows that depression is 50% higher in women [2] and leading causes of disease burden for women aged 14-44 years [3]. Worldwide data also shows that around 10% of pregnant women and 13%

of postpartum women experience mental disorders, especially depression. This illness is more prevalent in developing nations, 15.6% during pregnancy [4]. Recent research on depression in Indonesia found that 21.8% of research subjects aged >15 years experienced moderate and severe depression where-by of these, women are higher by 22.3% [5]. Puberty-related hormonal changes have been linked to depression in women, before menstruation, during pregnancy, after childbirth, and pre-menopause [6]. Other factors that cause depression are genetics, psychological and social life stressors. The incidence of depression is quite high in pregnant and postpartum women [7].

Depression if it occurs in the mother (maternal) can have a negative impact on growth, development, child care processes with substantial effects on physical, mental, and emotional health throughout critical periods like the first 1000 days and early childhood. Practices relating to breastfeeding, healthcare, safety, and infant development will be altered in depressed women [3]. Antenatal depression or depression in pregnant women is influenced by various factors, one of which is the stressor of social life that comes from their household life. One of them is domestic violence. Domestic violence has been documented in both industrialized and developing nations, and it is not just a serious socioeconomic issue that is also related to public health [8]. Domestic abuse while pregnant also harms pregnant women's health, but also has negative consequences on neonates' health and childhood development [9].

Domestic abuse sufferers who are expecting mothers also struggle with anxiety and sadness. According to research, pregnant women who endure partner abuse are 2.5 times more likely than non-pregnant women to experience depressive symptoms [10]. These depressed symptoms could be a direct or collateral effect of domestic abuse [11]. Several primary studies reported the effect of domestic violence on antenatal depression. Beketie et al. (2018), in their research, stated that mothers who experienced domestic violence had a risk of increasing 1.10 times the risk of antenatal depression compared to mothers who never endured domestic abuse [12]. Brittain et al. (2015) also stated that mothers who experience domestic violence are 1.9 times at risk of experiencing antenatal depression [13]. Number of primary studies examining the effects of domestic violence on antenatal depression. Encouraging researchers to conduct a more comprehensive review of the primary study. The primary data will be analyzed using a systematic review and meta-analysis by synthesizing the results of the primary research that has been conducted to reduce bias.

2. Method

This study's methodology includes both a meta-analysis and a systematic review study design. The article search process took place between 2008 and 2022. The Google Scholar, PubMed, Springer Link, and ScienceDirect databases were used to find the publications for this investigation. The process of searching for articles lasted for 2 months with keywords (“Intimate Partner Violence” OR “IPV” OR “Domestic Violence”) AND “Antenatal Depression” OR “Antepartum Depression” AND (“adjusted odds ratio” OR “multivariable”). Pregnant women were the research topic, and the inclusion criteria for papers in this study comprised the entire text of the articles, the intervention given was experiencing domestic violence, the comparison was not experiencing domestic violence, The article's findings included antenatal depression, an observational study design, and multivariate analysis with adjusted odds ratio. The only bivariate article results and non-English and Indonesian articles were excluded from this study.

The PICO model's determined eligibility criteria were considered during the article search process. The population of this study included expectant mothers who had been the victims of domestic abuse, with comparison they did not experience domestic violence, and the outcome was antenatal depression. Quality assessment of cohort study articles is conducted using the Critical Appraisal Skills Program (CASP) checklist (2020), while articles on cross-sectional study

design are evaluated using the Critical Appraisal of a Survey CEBMa checklist. Operational definition: Domestic violence is the presence of physical, sexual, or psychological abuse. Examples include hitting, kicking, coerced sex, psychological abuse like intimidation and humiliation, and controlling behavior like isolating a victim from friends and family or restricting access to information and support.

The mood illness known as antenatal depression affects pregnant women and is characterized by feelings of fatigue, loss of interest, enthusiasm, guilt, or low self-esteem, as well as disturbed sleep, irregular eating, and impaired concentration. The data were processed with the use of the Review Manager (RevMan 5.3), which calculated the Adjusted Odds Ratio and heterogeneity to select which research models were integrated and produced the meta-analysis's final findings.

3. Results and Discussion

3.1. Results

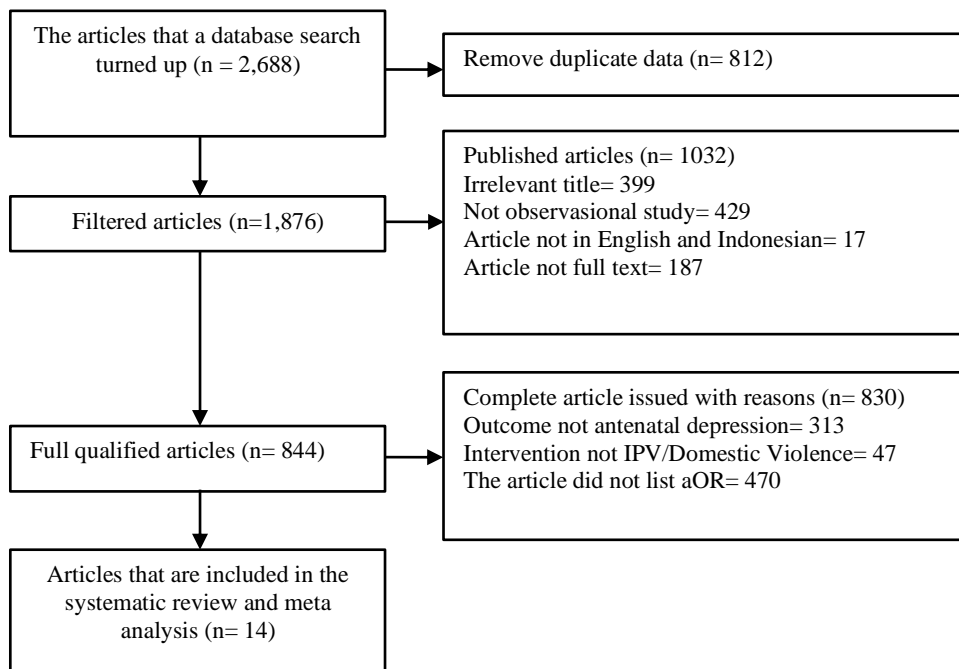


Figure 1. PRISMA flow diagram

Figure 1 shows the outcomes of the search process. In total, 2688 articles were retrieved and 812 were excluded because of duplication. Selection based on irrelevant title, not observational study, articles not in English and Indonesian also not full text excluded a further 1032 articles, resulting in 844 articles capable of full-text screening. 830 articles were discarded after full-text screening, leaving 14 for the systematic review and meta-analysis.

Table 1. Article Quality Category

Author	Total	Score
Britain et al (2015)	24	100%
Utete et al (2020)	23	95.8%
Woldetensay et al (2018)	24	100%
Rodriguez et al (2008)	22	91.7%
Ayele et al (2021)	24	100%
Beketie et al (2021)	24	100%
Belay et al (2019)	24	100%
Belette et al (2019)	23	95.8%
Beyene et al (2021)	24	100%
Lodebo et al (2020)	23	95.8%
Tamiru et al (2022)	24	100%
Yu et al (2018)	24	100%
Manongi (2017)	22	91.7%
Govender et al (2020)	24	100%

Table 1 shows the assessment of the quality of the articles based on the grading of the quality assessment checklist for evidence by Cochrane which is divided into 4 parts, namely:

- a. 76% - 100%: high quality
- b. 51% - 75%: moderate quality
- c. 26% - 50%: low quality
- d. 1% - 25%: very low quality

Based on the assessment of the quality of the primary articles in Table 1 for both the cross-sectional and cohort study designs above, the scores for the quality of the articles range from 76% - 100%, this indicates that the primary articles used are of high quality for meta-analytic studies.

Table 2. Descriptions of the primary research studies that were analyzed in the meta-analysis

Author (year)	Country	sample	intervention
Ayele (2021)	Ethiopia	409 Pregnant Women	Intimate partner violence
Beketie (2021)	Ethiopia	323 Pregnant Women	intimate partner violence
Belay (2019)	Ethiopia	589 Pregnant Women	Intimate partner violence
Belette (2019)	Ethiopia	342 Pregnant Women	Intimate partner violence
Beyene (2021)	Ethiopia	548 Pregnant Women	Intimate partner violence
Governor (2020)	South Africa	326 Pregnant Women	Intimate partner violence
Lodebo (2020)	Ethiopia	541 Pregnant Women	Recent violence from intimate partners
Tamiru (2022)	Ethiopia	1.015 Pregnant Women	intimate partner violence,
Yu (2018)	China	797 Pregnant Women	Intimate partner violence
Manongi (2017)	Tanzania	1.116 Pregnant Women	Exposure to at least one type of violence
Britain (2015)	South Africa	726 Pregnant Women	Intimate partner violence
Utetes (2020)	Zimbabwe	375 Pregnant Women	Intimate partner violence
Woldetensay (2018)	Ethiopia	4,680 Pregnant Women	Intimate partner violence
Rodriguez (2008)	United States of America	210 Pregnant Women	Intimate partner violence

Based on Table 2, the 14 articles consistently used a sample of pregnant women with an average sample size of > 200 pregnant women with intimate partner violence interventions to find out cases of antenatal depression, with the study distribution divided as follows: South Africa (2 articles), America United States (1 article), China (1 article), Ethiopia (8 articles), Tanzania (1 article) and Zimbabwe (1 article).

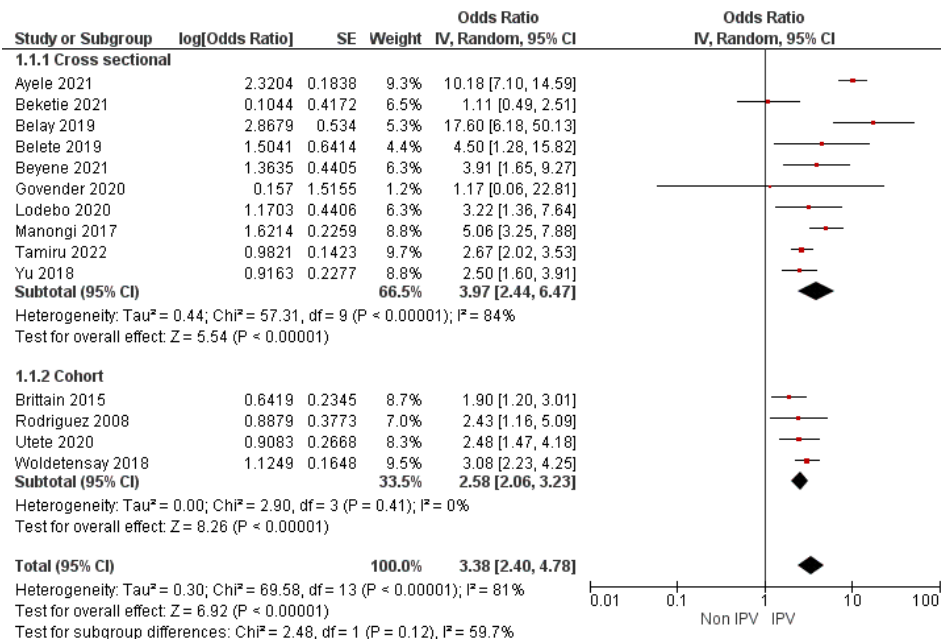


Figure 2. Forest plot

Based on Figure 2, it is known that the results of a 10 articles from a meta-analysis and a cross-sectional research concluded that domestic violence has a risk of antenatal depression 3.97 times statistically significant as compared to pregnant women who do not experience domestic violence ($p < 0.001$). The data's heterogeneity in this cross-sectional study shows $I^2 = 84\%$ so that it can be said that the distribution of data is heterogeneous (random effect model). The results of a meta-analysis of 4 articles with cohort studies concluded that domestic violence has a risk of antenatal depression 2.58 times statistically significant as compared to pregnant women who do not experience domestic violence ($p < 0.001$). Data in the cohort study that are heterogeneous shows $I^2 = 0\%$ so that the data distribution is deemed to be homogeneous (fixed effect model). The meta-analysis of all articles concluded that domestic violence has a risk of antenatal depression 3.38 times compared to pregnant women who do not experience domestic violence and is statistically significant ($p < 0.001$). The heterogeneity of research data shows $I^2 = 81\%$ so that the spread of data is stated to be heterogeneous (random effect model).

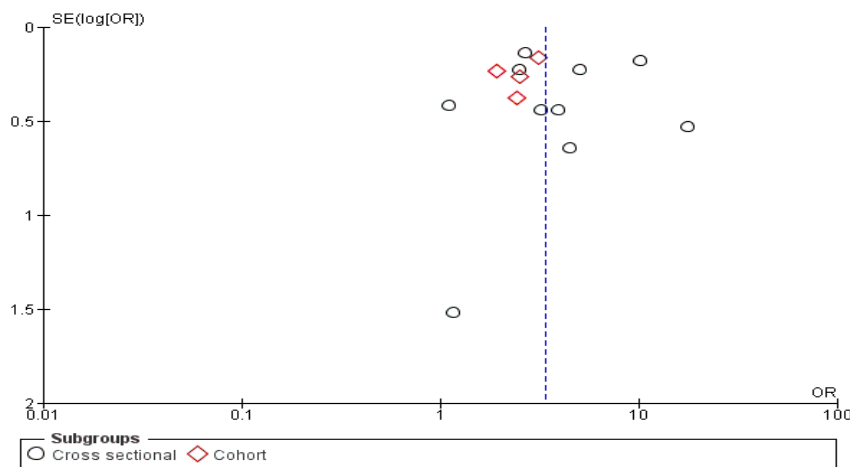


Figure 3. Funnel plot

Figure 3 showed that some of the primary studies used had an asymmetrical distribution

of plots, especially in cohort study designs. It can be seen that the plots are denoted in two according to the study design namely, cross-sectional black circles and red diamond cohorts.

1. Black circular plot (cross-sectional)

- a. The plot distribution is symmetrical, where there are 5 plots on the left and 5 plots on the right. It is interpreted that the results of the subgroup analysis of the cross-sectional study design are real estimates. It can be ascertained that the actual summary effect value is $aOR = 3.97$.
- b. The distribution of the sample used is not symmetrical, where it is more dominant using a large sample of 9 plots and a small sample of 1 plot.

2. Red diamond plot (cohort)

- a. The distribution of plots is asymmetrical, where all plots are on the left. This is interpreted to mean that there was an over estimate in the subgroup analysis of the cohort study design. It can be ascertained that the actual summary effect value is $aOR < 2.58$.
- b. However, the sample distribution is symmetrical, where all use large samples.

3.2. Discussion

In a systematic review research and meta-analysis, the topic of the connection between domestic violence and the occurrence of prenatal depression was raised. Domestic violence is the independent variable under investigation. Antenatal depression was the dependent variable under investigation. The results of the primary study, which involved a systematic review and meta-analysis, recommended an epidemiological study design with a larger sample and various demographic characteristics, providing a foundation for the conclusion that domestic violence has a statistical impact on the incidence of antenatal depression.

Studies that fulfilled the analysis criteria were primarily located in Asia (China), North America (United States), and Africa (Ethiopia, Zimbabwe, South Africa, and Tanzania), according to the results of systematic reviews and meta-analyses of primary studies. A meta-analysis of a cross-sectional study's findings revealed that domestic violence can cause prenatal depression to occur 3.97 times more frequently than it would in people who don't experience it ($aOR = 3.97$; 95% CI = 2.44 to 6.47; $p < 0.001$). Whereas the cohort study showed that domestic violence can increase the incidence of antenatal depression by 2.58 times compared to not experiencing antenatal depression ($aOR = 2.58$; 95% CI = 2.06 to 3.23; $p < 0.001$).

Domestic violence perpetrated by a partner or husband is a serious global health problem. Incidents of violence are assessed based on their types, namely psychological violence, physical violence and sexual violence. If a woman says that she was exposed to one of these types of violence, then she is considered to have experienced domestic violence [14]. The physical and mental health of women and their children can be negatively impacted by domestic abuse in both the short and long term. One of the Sustainable Development Goals (SDGs) is to eliminate all forms of violence against women and girls, including human and sexual trafficking as well as other types of exploitation, in both the public and private spheres, as stated in point 5.2 of the SDGs [15]. The research results of Sardinha et al. (2022) show that in 2018 globally, it was projected that 27% of women aged 15 to 49 who had ever been in a relationship had ever been the victim of physical, sexual, or both forms of intimate partner abuse. In low-income countries vs high-income ones, there are different geographical trends in domestic violence instances [15]. It is becoming more well acknowledged that domestic abuse during pregnancy is a serious issue with serious health effects for both women and their unborn children. Compared to industrialized countries (3.4% to 11%), the prevalence range is substantially wider in developing countries (3.8% to 31.7%) [16]. This could relate to why lower incomes are associated with higher cases of domestic violence. According to research on domestic abuse of expectant women in Indonesia,

there is less chance of domestic abuse the wealthier the expectant woman is. Domestic violence is more likely to occur in households where pregnant women live with their husbands or partners. This also applies to pregnant women with high parity categories at higher risk of experiencing violence than primiparous pregnant women. Husbands/partners who are younger also increase the likelihood of violence occurring among pregnant women. Last but not least, pregnant women with husbands or partners who have only completed elementary or junior high school are more likely to face violence than those with illiterate husbands or partners [17].

According to estimates, everywhere in the world, there is a 15–71% prevalence of intimate partner violence, with 1-28% of pregnant women reporting this type of assault [18]. Low birth weight, anemia, early delivery, low mother weight, kidney infection, miscarriage, neonatal death, and poor mental health are all major effects of domestic abuse on the health of the fetus. A meta-analysis of cross-sectional and cohort observational studies was used to conduct this study. The results of a meta-analysis in a cross-sectional study showed that domestic violence can increase the incidence of antenatal depression by 3.97 times compared to not experiencing domestic violence (aOR= 3.97; 95% CI= 2.44 to 6.47; $p < 0.001$). Whereas the cohort study showed that domestic violence can increase the incidence of antenatal depression by 2.58 times compared to not experiencing domestic violence (aOR= 2.58; 95% CI= 2.06 to 3.23; $p < 0.001$). Research by Mahenge et al. (2013), showed that women who had experienced physical or sexual violence during pregnancy tended to have a higher anxiety score (aOR= 3.98; 95% CI= 2.85 to 5.57) and were 3 times more at risk of having a higher depression score (aOR = 3.31; 95% CI= 2.39 to 4.59) [18].

In line with the research of Wu et al. (2019) which stated that women who experienced domestic violence as a whole during the COVID-19 pandemic were 3.864 times at risk of experiencing depression during pregnancy (aOR= 3,864; 95% CI= 2,095 to 7,125; $p < 0,001$ (19). Depression during pregnancy generally occurs due to hormonal changes and biological changes in pregnant women [20]. However, every woman's pregnancy experience is different and is greatly influenced by the stability of her social relationships. One of them is the existence of domestic violence which makes pregnant women feel depressed and lack support from their partners.

The limitation in this study is the presence of publication bias which is indicated by the asymmetric distribution of the plots on each side. Another bias that occurs is language bias because researchers only use English and Indonesian, thus ignoring articles in other languages. Hence our result may not give the true picture or extent of the issues. Search bias also occurs because researchers only use Google Scholar, PubMed, Springer Link, and ScienceDirect, thus ignoring other search sources.

4. Conclusions

Domestic violence can increase the incidence of antenatal depression in Asia, Africa, and North America in the study design of this meta-analysis. This study shows that there is heterogeneity of data as evidenced by the distribution of data. However it can be a baseline, to indicate the seriousness/ impact on global health & in achieving SDGs. It is hoped that with this research the government and the community can reduce or prevent incidents of domestic violence so as to reduce the incidence of depression in pregnant women to achieve a better maternal and child health in the community. Future researchers can conduct similar studies at their own study setting on the wider continents.

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Author Contribution

DAS and NMI is the main researcher who selects topics, explores, collects and analyzes research data. MAR and TAP played a role in searching articles, making discussions, conducting article reviews. All authors are involved in making critical appraisal.

Conflict of Interest

There is no conflict of interest in this research

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