

Depression and Anxiety in Early Pregnancy and Its Risk for Preeclampsia

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ABSTRACT

Handling depression is one of the greatest challenges facing pregnant women across the globe. The level of antenatal depression and anxiety has a prevalence rate of above five percent but less than twelve. Escalated depression has been associated with increasing maternal and infant mortality because of the development of secondary disorders such as preeclampsia and other obstetric-related conditions. The objective of this review was to determine the relationship that exists between depression and anxiety and preeclampsia in early pregnancy.

The present paper draws conclusions on the etiology and potential predisposing factors of preeclampsia based on the studies consulted which ascertained the existence of a correlation between antenatal anxiety and depression and preeclampsia which should serve as the baseline for the assessment of the pathogenesis and future direction, the existing literature has

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INTRODUCTION

Depression and anxiety among pregnant women is a common condition that has been reviewed and examined over the years. Worth pointing out is that frequent exposure to hypertensive disorders has been associated with different health complications that contribute to increasing maternal as well as fetal mortality. One of the common disorder is preeclampsia, which is a hypertensive condition among pregnant women that is exhibited after the first 20 weeks⁽¹⁾. The disorder has been investigated in different studies with limited finding regarding the etiology. Such outcomes have contributed to the need for extensive analysis of the risk factors, implication, and prevention measures to ascertain the rate of diagnosis among pregnant women. An estimation of about 2-7% of pregnancies across the globe is at risk of being associated with preeclampsia⁽²⁾. The percentage of diagnosis is high as compared to the general hypertensive tendency in early pregnancy, which stands at about 8%. Currently, several risk factors have been identified as contributing factors such as lifestyle, sleep

disorder, high hemoglobin, and psychological factors⁽²⁾.

On the other hand, different studies have been carried out to determine the effects emanating to exposure to depression and anxiety during the early pregnancy among women. The studies have examined various risk factors and correlation to other condition and psychometrics elements. However, the key concern regarding depressive tendencies and anxiety among pregnant women is in line with the prevalence of preeclampsia. Most studies have been centered on the correlation between stress-based diagnosis and the onset of preeclampsia⁽²⁾. The condition has been noted to have a high prevalence and risk factors, which contributes to increasing maternal and infant mortality. Nevertheless, the large number of scholarly evaluations have been associated with limited etiological validity that reveals the reasons why preeclampsia is common during early pregnancy⁽²⁾. The meta-analysis approach that has been undertaken in this review has considered multiple results from the various key studies

carried out to determine the extent to which the existing gaps in research have been filled. On the other hand, the focus on etiology presented in the studies included in this paper is meant to expound on the risk factors and prevalence rates associated with the relationship between depression and anxiety and preeclampsia during early pregnancy.

METHODS

The existing studies have focused on different approaches to achieve the intended objectives in line with the nature of factors being investigated. A study that focused on the assessment of the level of anxiety among pregnant women in line with the prevalence of preeclampsia considered a case-control approach⁽²⁾. In the research, the methodology allowed for assessment of 150 pregnant women diagnosed with preeclampsia while a control experiment involved other 150 women without the condition⁽²⁾. Case-control approaches have been used extensively whenever a comparative approach is required to evaluate the implication of the disorder based on existing health status of those under investigation. In such a case, other control factors necessary for reliable and valid analysis are incorporated. Moreover, a cross-sectional approach is also common when examining the effect of depression and anxiety among women during early pregnancy. Research that evaluated the level of prevalence and risk factors among pregnant women at a Rio de Janeiro, Brazil health facility considered a cross-sectional analysis of over 331 women⁽³⁾. The evaluation of the risk factors was carried out over a period of one year, which focused on demographic factors, social orientations, and violence during pregnancy, and medical conditions such as obstetrical tendencies.

Other studies have been based on a mixed approach where the qualitative and quantitative measures have been included to ascertain the implication of depression and anxiety associated with early pregnancy. The assessment of pregnant women screened in obstetrics environment and depicted depressive symptoms included the evaluation of the 3472 women⁽¹⁾. The variables that were examined included the specific risk factors that lead to mood symptoms during the early stages of the pregnancy.

Therefore, having a segregated analysis based on factors such as age cluster, the number of visits, and use of tobacco and alcohol was necessary to ascertain the level of contributing elements based on metric and non-metric assessments⁽¹⁾. On the other hand, a prospective population-based evaluation has been essential in measuring the degree of risk for preeclampsia among women diagnosed with depressive symptoms and anxiety. Research that examined 623 nulliparous women with singleton pregnancies involved the examination of the main symptoms among women whose blood pressure was above 140/100 mmHg⁽⁴⁾. Therefore, the methodology was necessary to distinguish preeclampsia-specific risk factors from the Beck Depression vulnerability. However, the level of depression and anxiety remained the baseline variable to the assessment of preeclampsia diagnosis as well as the magnitude of prevalence.

FINDINGS

This review focused on seven key studies that examined the risk factors associated with the onset of preeclampsia among women during early pregnancy. The studies examined the behaviors linked to depression and anxiety and the relation to the condition. Most studies have reviewed the rate at which pregnant women developed the disorder; however, the approach to the variables being examined has been different. A study seeking to examine the relationship between escalated anxiety among pregnant persons and the beginning of preeclampsia symptoms found out that the correlation was weak⁽²⁾. In fact, both the sampled group as well as the control population all depicted anxiety tendencies; however, among those diagnosed with preeclampsia, only 26.7% showed depressive symptoms while 10.7% of the control group were also diagnosed with anxiety⁽²⁾. Therefore, based on the values that characterized the evaluation process, anxiety presents preeclampsia risk of about 2.9 fold when compared with those not diagnosed with depression⁽²⁾. Nevertheless, the results relating to this research was different from the other four studies based on the nature of the variables, population samples, and control factors examined in assessments.

Moreover, other studies examining the effect of depression and anxiety in line with the diagnosis of preeclampsia among women considered the use of Composite International Interview. Based on the analysis of over 331 women during early pregnancy, the rate of prevalence of depression was estimated to be 14.2%, with a significant rate of preeclampsia development of less 3.7%⁽³⁾. Most of the factors that were dominant when examining the risk elements included the previous history of psychiatry-related conditions, nature of casual labor, unplanned pregnancy, and several serious illnesses diagnosed during the pregnancy period⁽³⁾. On the other hand, the results depicted the need for the screening of the contributing factors within a setting where the pregnant women involved in the study are receiving care. Moreover, a mixed approach study that evaluated 3472 pregnant women above 18 years old using screening questionnaire revealed a 20% showed the risk of developing depression while 13.8% were diagnosed with depressive disorder and anxiety⁽¹⁾. The report linked several factors as the contributors of the prevalence, which included health factors, use of constituents such as alcohol and tobacco, and social factors such as unemployment and lower education attainment. Although the need for higher validity was clear, the study evaluated various risk elements, and the sampled population was significant⁽¹⁾.

Furthermore, other scholarly findings have associated depression with 4.5% preeclampsia diagnostic rate among pregnant women at an early stage⁽⁴⁾. The findings emanated from the prospective population-based analysis of 623 women where high blood pressure was the metric used to determine the level of depression and anxiety. One of the major findings of the study was the correlation between the Beck Depression and preeclampsia disorder. Moreover, over 30% of women involved in the survey showed depressive symptoms; however, only 28 of them, which forms 4.5%, were diagnosed with preeclampsia⁽⁴⁾. The results, therefore, showed a correlation between the level of anxiety as a risk factor for the development of the condition. On the other hand, the results regarding the risk of developing

depression were also estimated at 30% among pregnant women⁽⁵⁾. The main contributing factors have remained to be associated with health status, the nature of environmental factors, and social-based elements that affect the life of pregnant women. Based on the findings from the main studies included in this meta-analysis, it is clear that depression and present anxiety pathways for developing preeclampsia; however, little evaluation has been done regarding the etiology of the correlation.

Depression and Risk Factors during Pregnancy

Pereira and the colleagues⁽³⁾ showed that the prevalence rate of antenatal depression in their analysis was 14.2% when a sample of pregnant women was assessed. The scholars went ahead to examine the factors that contributed to the rate associated with the findings. The researchers found that several factors enhanced the development of depression or high anxiety among the sampled women. One of the main conclusions of the essential risk factor dimensions included the nature of work. Women who were subjected to casual labor with low pay were found to have developed depressive symptoms. The reason for the inclusion of the factor was based on the increasing pressure on family and personal needs, which escalates the budgeting cost. The second elements that were found to contribute to the growing antenatal depression among the sampled women were the possibility of a previous history relating to any form of psychiatric diagnosis or depression⁽³⁾. Other factors such as unplanned pregnancy as well as stressful living based on social challenges such as the loss of loved ones or financial difficulties also contributed to the 14.2% depression diagnosis among the sampled women.

The risk factors identified in the assessment of Pereira and the colleagues⁽³⁾ have featured in other scholarly evaluation and analysis. Songul and Calik⁽⁶⁾ examined the various factors that create avenues associated with the development of depressive symptoms. The research considered several dimensions among pregnant women that could contribute to the development of secondary disorders such as preeclampsia.

The scholars showed that sociodemographic factors have a significant effect in developing depression. On the other hand, the study pointed out that these social-based factors augment the tendency to aggravated antenatal depression and anxiety. Some of the factors presented in the evaluation included the income level of the women and their respective husbands, the lack of adequate income, and negative life experiences. Moreover, other elements such as low job satisfaction levels and the degree of education status were also part of the sociodemographic risk factors for antenatal depression^(7, 8, 9, 10). The broad cross-section included in the research process showed a higher validity of the social factors increasing depression among women during early pregnancy. Scholars who have also emphasized on education level have ascertained the severity of depression increase with a decrease in the degree of education^(6, 11).

Furthermore, unplanned pregnancy has featured in many studies where those women with undesired pregnancy contributed to a high rate of depression development^(12, 11, 10). A critical analysis of literature regarding the development of risk factors are diverse but worth pointing out is that the factors present different prevalence rate among various population samples included in the analysis. A wide range of studies indicates repeated contributing factor, which occurs at various percentages. Exposure to the factors identified to escalate the development of depressive symptoms may differ from one individual to another, which presents the variability in prevalence rates exhibited in different studies⁽³⁾. Nevertheless, the factors that contribute to the increasing level of antenatal depression based on a comparative analysis of the existing literature shows that social factors have a high capacity of aggravating the rate of diagnosis across exposed populations⁽⁵⁾. Therefore, this meta-analysis found out that unplanned pregnancy, the level of income, job satisfaction, negative life experiences, physical violence, and psychological disorders contribute to the development of depression and anxiety among pregnant women^(7,8,9,10,11,12). Moreover, such diagnosis could present secondary disorders that

could increase the rate of maternal and infant mortality across vulnerable populations⁽⁶⁾.

Depression and Prevalence Rate During Pregnancy

The results of the research that Pereira and the group⁽³⁾ carried out regarding the prevalence of depression and anxiety during early pregnancy showed a higher level of validity and reliability. The risks factors correlated to the results of previous analysis relating to the subject across different regions. Several studies have reported a prevalence rate of between 12% and 20% for the various forms of antenatal depression among women during early pregnancy^(13,14,15).

The rate of diagnosed women for each sample depended on the nature of group included in the study^(16, 17). The evaluation of the rate of depression among a sample obtained from a hospital-based clinic showed a significant rate that was high than the hypothesized value at 19.1%⁽¹⁸⁾. A sample that was restricted to adolescents showed a significantly higher value that the ones depicted in women above 18 years, which was at 20.8%⁽¹⁹⁾. On the other hand, some studies have shown extremely high rates of diagnosis regarding antenatal depression and escalated anxiety during pregnancy. For example, a study that focused on a group of women in Brazil showed that the rate of prevalence for early-stage pregnancy depression was 37.8%⁽²⁰⁾.

Moreover, the prevalence rate has differed from one country to another. The evaluation of the rate of diagnosis in developed countries has shown relatively lower values that developing states⁽¹⁸⁾. A study that included a sample of pregnant women from Japan showed that the prevalence of antenatal depression is 5.6%, which was lower that the findings of the research that Pereira and the group⁽³⁾ carried out. A similar study regarding the rate of diagnosis of antenatal depression conducted in Hong Kong showed a 6.4% rate of diagnosis while in America, the number of pregnant women affected was estimated at 9%⁽²¹⁾. Scholarly studies in Sweden, United Kingdom, and Finland were associate with a prevalence rate of 6.9%, 8.7%, and 7.7% respectively^(6, 22, 23). The values show that the rate in the United

States is higher when compared with the prevalence in other developed countries. Such trend emanates from the sociodemographic factors associated with the state, which defines the quality of life and social interrelations. Therefore, based on the findings of the studies compared in this analysis, the contributing factors mentioned in the previous section plays a key role in determining the number of women diagnosed with antenatal depression.

Antenatal Depression and Preeclampsia

The seven studies included in the meta-analysis revealed key factors associated with the level of anxiety and depression and the development of preeclampsia. The results indicated an average rate of prevalence between 2% and 8% across different countries. The rate in the United States was noted to be higher than the other developed states⁽²¹⁾. A critical analysis of the results of each study showed that several factors associated with depression contribute to the development of preeclampsia. For example, the studies evaluated indicated that the lifestyle factors, as well as health-related issues, contributed to the development of antenatal depression. The percentage of the samples used in the analysis of the correlation between preeclampsia and antenatal depression showed that the average prevalence rate of depression of about 12% was associated with a 2-5% of preeclampsia development^(3, 6). The focus of scholars has been the connection between preeclampsia and depression and anxiety during early pregnancy. Based on the assessment of the findings of the key studies used in this meta-analysis as well as other publications from the consulted databases, the following four key areas form part of the revelations presented in the studies.

Etiology of Preeclampsia

Preeclampsia is a complication that develops during pregnancy associated with high blood pressure. The disorder also results in the presence of protein in the urine commonly depicted after the first 20 weeks of pregnancy⁽²⁴⁾. Advanced levels of preeclampsia may affect the liver, the kidney, and the lungs, as well as the vision capacity of those affected. Based on

the adverse effect of the disorder, the mother and the child may face a risk of death, which makes the disease as one of the contributing factors to infant and maternal mortality. Preeclampsia has been associated with conditions such as obesity and hypertension; however, little evidence has been conducted to justify the validity and reliability of such proposed correlation⁽²⁵⁾. Other proposed factors associated with the disease is the previous diabetes diagnosis. Nevertheless, the first pregnancy has been linked to preeclampsia development, which provides more chances of the vulnerability of continuous preeclampsia diagnosis. Therefore, the diagnosis of Preeclampsia is based on the blood pressure beyond the normal rates of 140 mmHg systolic⁽²⁵⁾.

Moreover, preeclampsia is diagnosed in two levels: severe and mild preeclampsia. The severe preeclampsia is associated with high level of hypertension, dysfunctional organs, or heavy proteinuria. On the other hand, the level of maternal and infant mortality is used as the baseline factors for severity of preeclampsia^(12,25). Chances of secondary diagnosis to advance to the severe preeclampsia level is high and occurs rapidly, which calls for immediate intervention whenever the associated symptoms have been identified⁽²⁵⁾. Some of the proposed early intervention that has raised critical debate and calls for in-depth research includes the use of anti-inflammatory regimen and other nutrients alternatives, which are meant to increase the level of calcium, vitamin C, and vitamin E in the body.

Nevertheless, the termination of pregnancy has been the preferred approach to treatment. Subject to debate and further research is the limited but significant cases involving women who exhibit transient postpartum aggravation even after the placenta has been removed. Therefore, the existing literature does not present a comprehensive etiology regarding the preeclampsia and treatment^(6, 25). However, the unusual symptoms associated with the condition include pitting edema, which occurs in different forms, should be subjected to further assessment. Moreover, based on the lack of specific symptoms and physical signs linked to preeclampsia, it is important for those at risk to

consider regular screening and precautionary measures to enhance the prevention capacity ⁽²⁵⁾.

Scholarly Analysis: Preeclampsia Prevalence and Risk Factors

Several scholarly assessments have linked depression and anxiety to preeclampsia in early pregnancy ⁽³⁾. Kurki and the colleagues looked at the correlation between antenatal depression among sampled Finland women in line with preeclampsia development ⁽²⁶⁾. The study involved 623 women who were 8-17 weeks pregnant where the assessment included the questionnaires as well as a Beck Depression Inventory. The evaluation process considered the regular prenatal visits as well as the post-delivery period. The findings of the research depicted how 4.5% of the women who participated in the assessment had preeclampsia. The results were characterized by 30% depression diagnosis and 90% anxiety ⁽²⁶⁾. The scholars concluded that antenatal depression forms part of the risk factors for preeclampsia. In fact, the inclusion of the confounding factors adjustment still showed that women with depression were 2.5 times likely to develop preeclampsia while those with anxiety were 3.2 times ⁽²⁶⁾.

Moreover, other scholars who considered the anxiety factor during pregnancy also linked the risk factor to preeclampsia in early pregnancy ⁽¹⁴⁾. Sikkema and the group showed that anxiety had a significant influence on those women who were eventually diagnosed with the preeclampsia disorder. Although the assessment only considered a sample of 250 women, still the level of validity was essential since 3.6% were tested positive for preeclampsia ⁽¹⁴⁾. The rate of prevalence was lower than the Kurki's and Kordi studies, which showed a rate of 4.5% and 5.3% respectively ^(2, 26).

On the other hand, Hans and the group revealed that SNS overactivity enhanced the chances of developing preeclampsia. Such results were linked to the increasing peripheral vascular resistance during pregnancy, which is induced by catecholamine ⁽²³⁾. Worth pointing out is that such revelations linking catecholamine and preeclampsia were disapproved based on the counter-analysis research ⁽²⁷⁾. However, preeclampsia is

associated with vasoconstriction, which could be an aftermath of high levels of anxiety. Such possibilities emanate from the increasing uterine vascular resistance common to women during early pregnancy ^(2, 28). Nevertheless, both the studies linked escalated anxiety to the development of preeclampsia among women.

Furthermore, the evaluation of the implication of uterine artery resistance effect and the level of anxiety showed a significant relationship between the two factors in line with preeclampsia development ⁽²⁹⁾. The results ascertained the changes in the uterine blood flow originating from increased anxiety. Such changes increase the uterine complexity during pregnancy, which increases the chances of developing preeclampsia. Moreover, the previously discussed studies showed the sociodemographic factors are the primary causes of antenatal depression. However, studies that have narrowed down to preeclampsia diagnosis have shown that there is a limited interrelation between social-based factors and preeclampsia ^(2, 6, 30). The specific factors included in the analysis were the prevalence of preeclampsia and hypertension during gestation.

Moreover, another study that emphasized on the existence of a correlation between depressive living among pregnant women and preeclampsia included the assessment of psychiatric-based disorders: stress, depression, and anxiety. The results showed the existence of a positive relationship, which affirmed the findings of other studies ^(2, 26, 27, 30). Vianna and the group ⁽²⁰⁾, Qiu and the colleagues ⁽³¹⁾, and Nisell ⁽³²⁾ found that depression contributed to the development of hypertensive tendencies that could encourage the development of preeclampsia and other related disorders.

Limited Preeclampsia Pathogenesis

Studies have shown the correlation between sociodemographic factors and the development of anxiety and depression among pregnant women. Several factors have been examined that established the foundation for scholars to advance the assessment of antenatal depression and preeclampsia. The existence of valid and reliable conclusion is scarce about preeclampsia and other depressive disorders during early pregnancy ⁽³³⁾. One of the concerns raised in

critic-based studies is the limited psychopathophysiology of preeclampsia in line with the prevalence of depression. The possibility of depression contributing to the impairment of uterine contractility has been linked to preeclampsia as well as operative delivery but limited evidence to ascertain the notion has reduced the level of validity associated with the results of most of the studies⁽³³⁾. A keen evaluation of the risk factor to depression revealed the lack of physical activity among women during early pregnancy as one of the contributors; therefore, researchers linked such factors to the development of anxiety and escalated depression, which could alter the uterine contractility generating the possibility of being diagnosed with preeclampsia⁽³³⁾.

Other propositions that have limited analysis in the effect of depression on the immunity level and inflammatory system stability, which are the major contributing factors to the prevalence of preeclampsia. Such arguments have been based on the activation of the vascular endothelium because of poor immunity and inflammatory system that enhance preeclampsia risk factors⁽³³⁾. Moreover, most conclusions have been founded on the implication of depression, which can be traced to hypertension diagnosis. High level of depression alters the hypothalamic-pituitary-adrenal axis, which is a similar occurrence with preeclampsia. Therefore, chances of researcher concluding the connection between antenatal depression and preeclampsia are possible without multidimensional and large sample studies⁽³³⁾.

Furthermore, other studies have contradicted the initial findings, which presents a challenge in drawing a meta-analysis conclusion. For example, the analysis of the effect of catecholamine on increasing peripheral vascular resistance led to the conclusion that depression is a key factor in the diagnosis of preeclampsia⁽²³⁾. However, the findings were challenged when another study showed the lack of any significant relationship between the catecholamine and preeclampsia⁽²⁷⁾.

FUTURE DIRECTION

Several drawbacks have been associated with the limited epidemiology assessment as well as

the existence of contradicting viewpoints. There is the need for an unconventional approach to the analysis of the correlation between anxiety and depression and the prevalence of preeclampsia in early pregnancy.

On the other hand, the inclusion of multicenter assessment will enhance future results regarding the level of reliability for the study^(2, 33). In most cases, a single point evaluation has considered a small group of women to make statistical conclusions. Moreover, working with different sets of groups based on age and other control factors based on pregnancy will assist in developing overall findings that will depict a higher degree of validity⁽³³⁾. The segregation of the independent factors and the dependent variable when handling multiple risk elements is essential for effective results. Having a specific focus on a particular factor to be examined will enable the scholars to exhaust the risk factor to enhance the understanding. Nevertheless, the interrelation between the risk factors associated with preeclampsia, anxiety, and depression present a new challenge calls for combined assessments⁽³³⁾. In such a case, using diverse population samples can guarantee a platform that can be used to make relative conclusions. Therefore, meta-analyses conducted on this topic found it necessary to ascertain the need for larger samples, multipoint assessment, and the use of grouped samples when seeking to evaluate the correlation between antenatal depression and anxiety and preeclampsia in early pregnancy.

CONCLUSION

In conclusion, depression and anxiety among pregnant women is a common condition that has been reviewed and examined over the years. Frequent exposure to hypertensive disorders has been associated with different health complications that contribute to increasing maternal as well as fetal mortality. Preeclampsia is one of the common disorders, which is a hypertensive condition among pregnant women that is exhibited after the first 20 weeks. The average rate of prevalence is between 2% and 8% across different countries. However, the rate in the United States was noted to be higher than the other developed states at above 9%.

Several factors associated with depression contribute to the development of preeclampsia. Several factors have been examined that established the foundation for scholars to advance the assessment of antenatal depression and preeclampsia. However, the existence of valid and reliable conclusion is scarce about preeclampsia and other depressive disorders during early pregnancy. There is the need for an unconventional approach to the analysis of the correlation between anxiety and depression and the prevalence of preeclampsia in early pregnancy. Using a large sample size and conducting multiple assessment will increase the validity of the results. Nevertheless, the studies have hinted the possibility of depression and anxiety having an effect on the development of uterine complications at an advanced stage that could present favorable circumstances that can cause preeclampsia.

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