

Perinatal depression: prevalence, outcomes and screening tools - a review of the literature

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ABSTRACT

Perinatal depression (PD) is a depressive disorder in women that occurs either during pregnancy and/ or within 12 months after delivery. PD has adverse outcomes not only for mothers, but also for their children and their family/husband. A review of literature was conducted to present a comprehensive review of the available research into depression, its prevalence, risk factors and the screening tools in the context of the perinatal period. The literature will provide the background for understanding perinatal depression and will support the need for the most appropriate perinatal mental health screening-tool, particularly depression in midwifery care.

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1. Introduction

Depression is defined as mental illness that is primarily shown by loss of interest in things that used to be enjoyable and/ or the presence of guilt, despair and sadness or mood inconsistency (Fundukian, LJ & Wilson, 2008). It is usually followed by sleep disturbance, loss of appetite or eating disorder, tiredness, tearfulness, and low self-esteem (Fundukian, LJ & Wilson, 2008; Organization, 2004). Depression is a public health problem and the World Health Organization (WHO) has identified it as 'a major cause of morbidity in the 21st century' (Organization, 2004).

In general women are three times more vulnerable to experience a depressive disorder than are men (Weissman, MM, Bland, R, Joyce, PR, Newman, S, Wells, JE & Wittchen, 1993). (Gavin, NI, Gaynes, BN, Lohr, KN, Brody, SM, Gartlehner, G & Swinson, 2005) found that for major depression alone, the final combined point prevalence was estimated as ranging from 3.1% to 4.9% at different times during pregnancy, and from 1.0% to 5.9% at varying times during the first postpartum year. For minor and major depression their final combined point prevalence was predicted to range from 8.5% to 11.0% at different times during pregnancy and from 6.5% to 12.9% at varying times during the first year postpartum.

2. Method

A comprehensive search of Science Direct, PubMed, Wiley Online, Ovid, and ProQuest electronic databases identified 36 articles for the literature review. Key search terms entered into the electronic search field included perinatal depression, antenatal depression, postpartum depression, postnatal depression, screening tools and detection. The literature publication years ranged from 2000 to 2019, although there was one document from WHO that was published in 1946 and six articles that were published in 1961, and 1993 to 1999, which gave essential information and knowledge about the

identification of perinatal depression. The articles reviewed were published in English and examined perinatal depression in the context of midwifery care and clinical psychiatry; consequently, any non-English articles were excluded. No restrictions on the research design outlined in the articles were made. The following literature is based on themes that are considered essential to understanding perinatal depression.

3. Results

3.1 Antenatal Depression

Antenatal depression refers to the presence of depressive symptoms during pregnancy period. An evidence suggests that in Low and Middle Income Countries (LMICs) the prevalence of mental disorders in pregnancy was 15.6% (Fisher, J, de Mello, MN, Patel, V, Rahman, A, Tran, T, Holton, S, Holmes, 2012), whilst in Asian countries the overall prevalence was 20% (Roomruangwong, 2011). In addition, depression during pregnancy was found as the predictor of postpartum depression.

3.1.1. Prevalence of Antenatal Depression

The prevalence of prenatal depression among Indonesian women is 12.5%, while that of postnatal depression among women at six weeks and six months after childbirth is at 6.6% and 8.2% respectively (Sutjahjo, SA, Manderson, L & Astbury, 2007). Though there was a research on the prevalence of perinatal depression in Indonesia, this study was based on self-reports using the EPDS. According to the latest data, the number of illiteracy rate in Indonesia is 8.5 million people, and 60% of this rate comprises women (Nahaba, 2012). This means that to detect perinatal depression as effectively as possible, structured interviews by healthcare professionals using standardized instrument is needed.

Based on several of the research papers found, there are wide variations in the estimates of the prevalence of antenatal depression. However, evidence suggests for major and minor depression (major depression alone), the combined point prevalence estimates from meta-analyses ranged from 6.5% to 12.9% (1.0–5.6%) at different trimesters of pregnancy and months in the first postpartum year (Gavin, NI, Gaynes, BN, Lohr, KN, Brody, SM, Gartlehner, G & Swinson, 2005). The prevalence of antenatal depression was at 7.4%, 12.8%, and 12.0% for first, second, and third trimesters respectively (Bennet, HA, Einarson, A, Taddio, A, Koren, G & Einarson, 2004).

3.1.2. Outcomes of Antenatal Depression

A prospective cohort study was conducted in Baltimore, Maryland. The study found that pregnant African-American women who had a CES-D score in the upper 10th percentile risked having a spontaneous preterm delivery 1.59 fold greater than those with a lower score (Orr, ST, James, SA & Prince, 2002). It concluded that antenatal depression was a risk factor to the incidence of spontaneous preterm birth, or births occurring at less than 37 weeks.

The risk of preeclampsia was also reported as 2.5 times higher in women who were diagnosed with depression using the BDI in Helsinki (95% CI, 1.1–5.4) (Kurki, T, Hiilesma, V, Raitasalo, R, Mattila, H & Ylikorkala, 2000). The sample of Kurki's study was 623 women who were followed from her 12–17 weeks of gestational age to their delivery. Fourteen of the 185 women who had a BDI score ranging from 3–17 were diagnosed to have preeclampsia. Preeclampsia is a major complication in pregnancy. It is identified as one of the leading causes of maternal mortality in pregnancy, childbirth, and postpartum following haemorrhage (Organization, 2004). Antepartum bleeding in pregnant women was also reported as increasing in mothers with a history of antenatal depression (Johnstone, SJ, Boyce, PM, Hickey, AR, Morris-Yates, AD & Harris, 2001).

Related to neonates' outcome, the relative risk for Low Birth Weight (LBW <2500 g) in infants of depressed mothers was 1.9 (95% CI 1.3–2.9) (Rahman, A, Bunn, J, Lovel, H & Creed, 2007). This means that the risk of low birth weight is 1.9 times higher in depressed pregnant women than in non-depressed pregnant women. In addition, the maternal risks reported to be associated with antenatal depression included antenatal bleeding, spontaneous abortion, and Caesarean section (Bonari, L, Pinto, N, Ahn, E, Einarson, A, Steiner, M & Koren, 2004; Jablensky, AV, Morgan, V, Zubrick, SR, Bower, C, Yellachich, 2005) Kurki et al, 2000. Neonates from depressed mothers also showed lower APGAR (American Paediatric Gross Assessment Record) scores than neonates from mothers who did

not show depressive symptoms during pregnancy (Chung, TKH, Lau, FTK, Yip, ASK, Chiu, HFK & Lee, 2001). Other findings from Chung et al (2001) study were that antenatal depression caused a statistically significant increased risk of epidural analgesia, caesarean delivery, and NICU admission (RR: 2.12; 1.74; 1.40 respectively). Furthermore, (Field, 2010) concluded that neonates of depressed pregnant women had higher cortisol and norepinephrine levels but lower dopamine and serotonin levels. Cortisol and norepinephrine are the two most common hormones secreted by the adrenals, which are produced under stressful conditions. Dopamine and serotonin work together in complex ways to hamper the production of cortisol (Field, T, Reif, MH, Diego, M, Schanberg, S & Kuhn, 2005).

3.2. Postpartum Depression

Postnatal depression is often the case of perinatal mental health. In fact, 15% of postnatal women will experience depression (NICE, 2004). In Asian countries, it was noted that the prevalence of postnatal depression was 21.8%, higher than the prevalence in developed countries (Roomruangwong, 2011). However, (Kalra, S & Einarson, 2006) believed that, many pregnant women choose not to participate in prenatal care until well into the second trimester. Postnatal depression may simply be the result of depressed women who are not seeking prenatal care during that period. Minor depression that occurs in pregnant women can get worse with the increase of gestational age.

3.2.1 Prevalence of Postpartum Depression

(Gaynes, BN, Gavin, N, Brody, SM, Lohr, KN, Swinson, T, Gartlehner, G, Brody, S & Miller, 2005) found that point prevalence of major depression alone was highest at two months postpartum (5.7%) and six months postpartum (5.6%). For major and minor depressions the point prevalence was highest at three months postpartum (12.9%). It then decreased slightly in the fourth through seventh month after delivery (9.9–10.6%). The combined period prevalence shows that as many as 19.2% of women had a depressive episode, and 7.1% had a major depressive episode during the first three months postpartum; most of these episodes had onset following delivery (Gavin, NI, Gaynes, BN, Lohr, KN, Brody, SM, Gartlehner, G & Swinson, 2005).

3.2.2. Outcomes of Postpartum Depression

Most findings on the impacts of postpartum depression are related to the condition of the baby and children of depressed mother in the future. The earliest adverse outcomes shown by neonates as a result of perinatal depression are lower APGAR scores. In addition, depression during the postnatal period is also reported as a risk factor of an unsuccessful bonding attachment between mothers' and their babies (Leung, BMY & Kaplan, 2009). This might happen symbiotically in that maternal depression can influence neonates' outcomes, and poor neonates' outcomes may also affect new mothers' moods. Ultimately, this condition directly impacts on breastfeeding and child nutrition. Patients may be emotionally detached from the infant and unable to display loving affection towards their baby and their family members (Beck & Driscoll, 2006). Physical and emotional stress during pregnancy and childbirth in conjunction with great demands of infant care may cause the patient to neglect other family members, increasing the women's feeling of self-worthlessness, isolation and being trapped. Patients may also feel as if they are inadequate mothers, causing them guilt and embarrassment (Fundukian, LJ & Wilson, 2008). Maternal fetal attachment was also associated with mother's psychological health (Perwitasari, Hakimi, M, 2019). The long-term effects of postpartum depression in the children may also occur. Studies have found that children born from women with a history of perinatal depression were more likely to have poor infant/children physical growth, malnutrition, emotional or cognitive problems, including an increased risk of attentional deficit/hyperactivity, anxiety, and language delay (Rahman, A, Iqbal, Z, Bunn, J, Lovel, H & Harrington, 2004; Talge, NM, Neal, C & Glover, 2007).

3.3. Tools to Assess Perinatal Depression

Formerly, postnatal depression became a major focus of study related to mental illness in women. Nowadays, mental health issues surrounding childbirth have brought a shift from the narrow concept of postnatal depression to a consideration of the broader concept of Perinatal Depression. This shift has been associated with a growing recognition of the potential for prevention and early intervention of depression in the perinatal period.

Much of the recent epidemiological data on depression have been obtained through the use of lay administered self-reported questionnaires, some of which have been validated for use in pregnant women. The items contained in the questionnaires are based on those contained in previously validated instruments and the diagnostic criteria for MDD (maternal depressive disorder) set forth by the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* (Kalra, S & Einarson, 2006).

Mothers with perinatal depression may not seek treatment due to lack of knowledge about the mood disorder or because of the tremendous stigma. They may fear that if they show their feelings, child welfare authorities may take their infants (Kalra, S & Einarson, 2006). Given this, health professionals should administer screening and early detection of perinatal depression in order to prevent its devastating consequences. There are at least five common tools that are usually used to detect the presence of depressive symptoms during the perinatal period. Specific details regarding five of the most commonly used detection instruments are outlined below.

There are many tools to assess or identify perinatal depression. The most often used screening tools within postnatal depression are the: Edinburgh Postnatal Depression Scale (EPDS); Postpartum Depression Screening Scale (PDSS); Beck Depression Inventory (BDI); Primary Care Evaluation of Mental Health Disorders Patient Health Questionnaire (PRIME-MD, PHQ); and the Center for Epidemiological Study Depression Scale (CES-D). The various numbers of screening tools provide a checklist as part of a mood assessment that can be applied in pregnant women and postpartum women (Hadwin, 2007).

3.3.1 Beck Depressive Inventory (BDI)

Aaron T. Beck, a pioneer in cognitive therapy, first developed the BDI in 1961. The BDI consists of 21 self-reported questions and 7 questions on a shorter form that is designed for administration by primary care providers. The 21 self-reported questions were developed to measure the severity, intensity, and depth of depressive symptoms in patients aged 13 – 80 (Fundukian, LJ & Wilson, 2008). The purpose of this instrument was to detect, assess, and monitor changes of the depressive symptoms in a person who is suspected having a depression. The BDI also contains several questions regarding mood, suicidal tendency, social withdrawal, sadness and loss of weight (Association, 1994; Fundukian, LJ & Wilson, 2008; Kalra, S & Einarson, 2006).

The BDI has been validated for use in pregnant women via a comparison against the National Institute of Mental Health Diagnostic Interview Schedule III (Kalra, S & Einarson, 2006). It should be noted that when the BDI is used to detect depressive symptoms in pregnant or postpartum women, there are several physical conditions shown by normal pregnant/ postpartum women, such as sleep disturbance and fatigability.

3.3.2. Postpartum Depression Screening Scale (PDSS)

The PDSS is a more recently developed instrument. Beck and Gable developed it in 2002 (Beck, CT & Driscoll, 2006). There are 35 self-answered questions which are designed to measure and assess the presence, severity and type of postpartum depression symptoms. It is tailored to examine symptoms specific to new mothers. This instrument has excellent sensitivity and specificity to detect PPD. It is written at a third grade level and usually most people complete it within 5-10 minutes (Epperson, CN, Ballew, 2006). There are three interpretations of a PDSS score. A PDSS total score range of 35-59 is a normal adjustment after delivery; a total score range of 60-79 indicates significant symptoms of minor PPD; and a total score ranged of 80-175 suggests a positive screen to major PPD. In this latter case, the patient should be referred to additional diagnostic evaluation or formal psychiatric evaluation as soon as possible (Beck, CT & Driscoll, 2006; Epperson, CN, Ballew, 2006).

The PDSS comprises seven statements about how a mother may be feeling after the birth of her baby. It consists of seven symptom content subscales and provides an inconsistent responding index that is used as an indicator of response validity. It uses a five point Likert response format (1 = strongly disagree; 5 = strongly agree). A higher score of PDSS indicates a higher level of postpartum depression and vice versa. Those seven dimensions of the symptoms are (Beck & Driscoll, 2006):

- a. Sleeping/eating disturbances
- b. Anxiety/insecurity
- c. Emotional lability
- d. Guilt/shame
- e. Cognitive impairment
- f. Suicidal thoughts
- g. Loss of self-esteem

3.3.3. Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME MD, PHQ)

This tool has been validated in 3000 obstetric patients by comparing psychologists' assessments over the telephone. It is considered as an accurate instrument to detect recent psychological stressor and functional impairment that are caused by mood disorders in populations of pregnant women (Spitzer, RL, Williams, JBW, Kroenke, K, Hornyak, R, McMurray, 2000). It usually takes 8.4 minutes for each physician to use the instrument (Spitzer, RL, Kroenke, K, Williams, JBW, 1999). Originally, it was developed to be used by clinicians such as psychiatrists, obstetricians, or nurses. It was then adapted to a patient self-administered questionnaire, with a sensitivity of 0.70 and a specificity of 0.95 (Spitzer, RL, Kroenke, K, Williams, JBW, 1999). There are three classifications of the total score. Total scores ranging from 5-9 are classified as mild depression; total scores ranging from 10-14 are identified as moderate depression and needs psychotherapeutic intervention, and total scores of more than or equal to 15 are concluded as severe depression, which needs pharmacotherapy and hospitalization as soon as possible (Kalra, S & Einarson, 2006).

3.3.4. Centre for Epidemiological Study Depression Scale (CES-D)

The CES-D was previously developed for use in studies of epidemiology of depressive symptoms in the general population (Kalra, S & Einarson, 2006). The National Institutes of Mental Health developed it in 1970. It contains 20 questions related to:

1. Sadness (Dysphoria)
2. Loss of Interest (Anhedonia)
3. Appetite
4. Sleep
5. Thinking / concentration
6. Guilt (Worthlessness)
7. Tiredness (fatigue)
8. Movement (Agitation)
9. Suicidal ideation

Its criteria were developed and selected from a pool of items from a previously validated depression scale (Radloff, 1977). It has been used extensively in psychiatric research even though its use has not been validated either for pregnant or postpartum women population. Yet the CES-D is one of the most common instruments used by clinicians and researchers to measure current levels of depressive symptoms, with a focus on the depressed mood both in the general and in the pregnant women population (Kalra, S & Einarson, 2006). In the general community it has a sensitivity of 1.0 and specificity of 0.88 to detect major depression (Kalra, S & Einarson, 2006).

3.3.5. Edinburgh Postnatal Depression Scale (EPDS)

The EPDS is a simple and short 10-question scale. It was first published in the *British Journal of Psychiatry* in 1987 devised by Cox et al. in 2003 (Kalra, S & Einarson, 2006). It is also validated for use in pregnant women populations. The EPDS has been accepted and used widely and is considered to be a gold standard in detecting the occurrence of postpartum depression (Hadwin, 2007). (Kalra, S & Einarson, 2006) observe that the inventory:

“specifies that it should not be used as a diagnostic tool, and all results should be confirmed by a careful clinical assessment. Women who score above the cut off of 12 are likely to be suffering from a depressive illness. The EPDS has a sensitivity of 0.50 and a specificity of 0.90 for the detection of depressive symptoms during pregnancy. It detects only mood related signs of depressive symptoms in order to avoid false-positives owing to erroneous detection of physiological symptoms consistent with depression as well as normal pregnancy”

Each item in the EPDS is rated on a scale range of 0 – 3. Possible total scores can range from 0 to 30. The EPDS contains questions about symptoms, which include:

- a. Inability to laugh
- b. Inability to look forward to things with enjoyment
- c. Blaming oneself unnecessarily
- d. Feeling anxious or worried
- e. Feeling scared or panicky
- f. Feeling unable to handle things
- g. Sleeping disturbances
- h. Feeling miserable
- i. Crying
- j. Harming oneself ideation

The EPDS may have positive benefits. It is not only good to identify low emotion, but it also provides a chance to discuss emotional health, regardless of the antenatal and postpartum EPDS score (Cox, JL, Holden, 2003). It does not provide a differential diagnosis of mental disorder, nor is it used to make a clinical judgement. It screens women who really need help and should be followed by diagnosis and intervention (Cox, JL, Holden, 2003).

EPDS is a self-answered questionnaire that has been widely used to detect postpartum depression. A cut-off score 12.5 shows major depression detected and a woman who meets this score needs further assessment. This instrument is very easy to use. It needs a relatively short time (5- 10 minutes) to answer the self-report questions. The antenatal care service and postpartum care services in Indonesia usually take 10-15 minutes for each client. Mostly, in each primary public health centre in Indonesia, there are only 2-4 midwives who run the maternity and child care. This maternity and child care are include antenatal care, labour, postnatal care, health reproductive services, family planning program, neonates and baby's care including giving immunisations. In addition, there are more than 30 clients in the maternity and child-care clinics in primary public health care everyday. Limited time during both antenatal and postpartum care also needs to be noted regarding the use of this instrument. For this reason, the EPDS is considered as the most appropriate instrument to detect perinatal depression. In addition, the issue of the use of local languages and the illiteracy rate have become the main barriers of this instrument's application. Thus, in order to minimize the biases that might occur, midwives need to conduct a structured interview using EPDS to detect perinatal depression.

A study was done in Taiwan, which compared the validity of EPDS and BDI in pregnant women. The results of this study found that EPDS had a better validity and satisfactory level of sensitivity and specificity to detect depressive disorders during pregnancy (Sutjahjo, SA, Manderson, L & Astbury, 2007). Another finding indicated that EPDS had different optimal cut-off points to detect depression symptoms among different trimesters. The optimal cut-off point of the EPDS for the second trimester was higher than that for the third trimester, yet there was no different optimal cut-off point for using the BDI in any trimester.

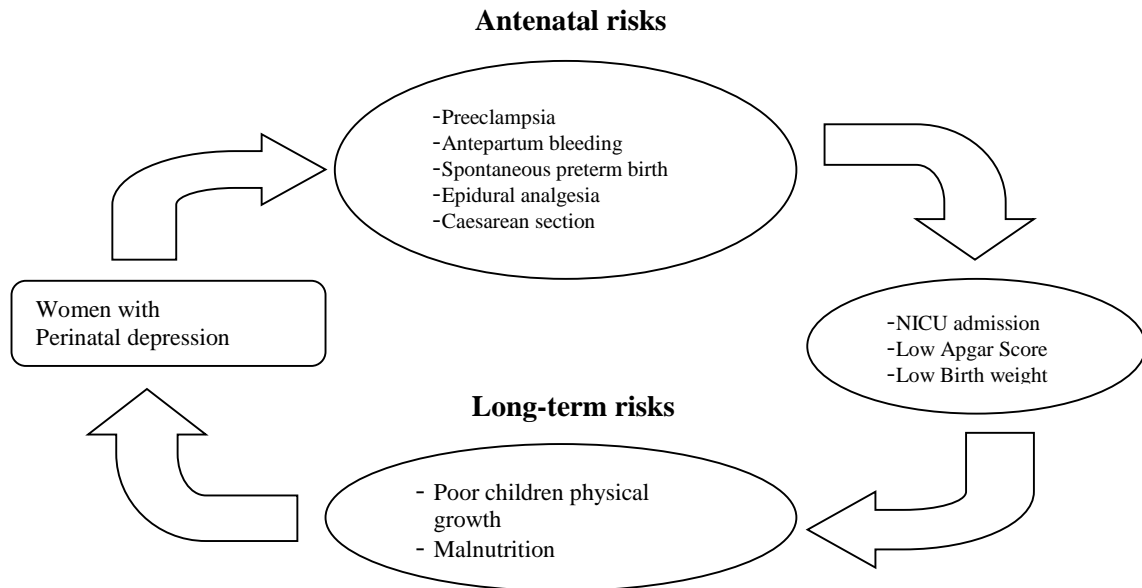


Fig. 1. Schematic model illustrating the short and long-term effects of perinatal depression.

Fig. 1. is a schematic model illustrating the short and long-term effects of perinatal depression. Once untreated perinatal depression occurs, it soon becomes a vicious cycle Perinatal depression needs appropriate tools to detect and to provide treatment. It is strongly correlated to maternal morbidity, substance abuse, and suicide. Therefore, prevention and early detection of perinatal depression are in line with Safe Motherhood Initiatives (2004). The Safe Motherhood Initiative aims to ensure all women receive the care they need to be safe and healthy throughout pregnancy and childbirth (Motherhood, 2004). It also agreed to establish a comprehensive national strategy in each country to guarantee a full range of high quality, affordable and accessible services in reproductive health, which focused on maternal and emergency obstetric care.

Below is a table that compares the five instruments based on the number of questions, contents, validity regarding their use in the perinatal period, time needed to use them, and the original target of the instruments.

Table 1. Comparison between 5 most common tools to detect depression among women

Instruments	Number of Questions	Content of Questions	Validity	Time Constraint	Previous Target
EPDS	10	<ol style="list-style-type: none"> 1. Inability to laugh 2. Inability to look forward to things with enjoyment 3. Blaming oneself unnecessarily 4. Feeling anxious or worried 5. Feeling scared or panicky 6. Feeling unable to handle things 7. Sleeping disturbance 8. Feeling miserable 9. Crying 10. Harming oneself ideation 	Used widely to detect depression either for pregnant or postpartum women	5 minutes	Postpartum Women
PDSS	35	<ol style="list-style-type: none"> 1. Sleeping/eating disturbance 2. Anxiety/insecurity 3. Emotional lability 4. Guilt/shame 5. Cognitive impairment 6. Suicidal thoughts 7. Loss of self 	Has been validated for postpartum women	5-10 minutes	Postpartum Women
BDI	21 self-reported questions and 7 questions on a shorter form that is designed for administration by primary care providers	<ol style="list-style-type: none"> 1. Mood disturbance 2. Suicidal tendency 3. Social withdrawn 4. Sadness 5. Loss of weight 	BDI has been validated for use in pregnant and postpartum women	Not available	Adult, General, Elderly people,
Prime MD-PHQ	26	containing modules on 5 different mental health disorders containing modules on 5 different mental health disorders	Has been validated to be used in pregnant women	8.4 minutes	Adult, General, Elderly people, children
CES-D	20	<ol style="list-style-type: none"> 1. Sadness (Dysphoria) 2. Loss of Interest (Anhedonia) 3. Appetite 4. Sleep 5. Thinking / concentration 6. Guilt (Worthlessness) 7. Tiredness (fatigue) 8. Movement (Agitation) 9. Suicidal ideation 	Has not been validated either for pregnant or postpartum women population	Not available	Adolescent and adults, general and clinical populations

4. Conclusion

Perinatal depression can cause devastating outcomes primarily to the mothers and their infants. Broad and wide literatures were found which highlighted the prevalence, impacts and instruments which can be used or has potential as screening tools to detect the symptoms of depression either in pregnancy or postpartum period. Most of the instruments were a self-reported questionnaire and therefore can be utilized in primary level of healthcare centre. However, the utilization of several screening tools and the different cut-off score might have impact on the wider range of prevalence of perinatal depression.

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