Review

Use of the Edinburgh Postnatal Depression Scale (EPDS) During Pregnancy Among Japanese Women: A Literature Review of Screening Timing and Cutoff Values

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Objective: This review aimed to examine the current use of the EPDS during pregnancy among Japanese women, with a focus on its timing, EPDS cutoff values during pregnancy, internal consistency as measured by Cronbach's alpha coefficient, and the rationale for EPDS cutoff score determination.

Methods: A comprehensive literature search was conducted using PubMed and EBSCO databases for peer-reviewed English-language articles published between January 2018 and December 2024. Original studies were included if they involved Japanese pregnant women, used the EPDS during pregnancy, and specified a cutoff score. Data extraction included study design, timing of EPDS use, EPDS cutoff values during pregnancy, Cronbach's alpha, and justification for score selection.

Results: Twelve studies met the inclusion criteria. EPDS was typically used in the second or third trimester, with few studies targeting early pregnancy. The most common EPDS cutoff values during pregnancy were ≧9 and ≧13. Seven studies used EPDS longitudinally across pregnancy and postpartum. Only three studies reported Cronbach's alpha, all exceeding 0.82. The rationale for EPDS cutoff values during pregnancy varied, with many referencing Okano et al. or Usuda et al.

Conclusion: There is currently no standardization in the timing or EPDS cutoff values during pregnancy for EPDS use during pregnancy in Japan. Further research is needed to validate appropriate cutoff scores and assess the psychometric internal consistency as measured by Cronbach's alpha coefficient of the EPDS across different stages of pregnancy to ensure effective screening and early intervention.

Key Words: Perinatal depression, Pregnancy, Edinburgh Postnatal Depression Scale**,** Screening

I. Introduction

Perinatal depression is one of the most significant health issues affecting women during pregnancy and the postpartum period. While postpartum depression, which typically onsets within 4–6 weeks after childbirth, has traditionally been the primary focus of attention, recent studies have demonstrated that depression during pregnancy is the most significant risk factor for postpartum depression[1)], leading to a growing recognition of the importance of early detection and intervention for depression, including during pregnancy. In Japan, studies have also reported that depressive tendencies during

pregnancy are risk factors for postpartum depression [2)3)].

The prevalence of perinatal depression varies by country and ethnicity, ranging from 8% to 26% [4)5)]. In Japan, according to a meta-analysis by Tokumitsu et al [6)], the prevalence rates were reported as 14.0% in the second trimester, 16.3% in the third trimester, and 14.3% one month postpartum.

Perinatal depression is also associated with maternal suicidal ideation, self-harm, and increased risk of maternal suicide [7)]. In Japan, the maternal mortality rate due to suicide related to mental disorders is higher than that due to obstetric complications, similar to other countries [8)]. In Japan, suicides attributable to mental disorders account for 8.7% of maternal deaths, which is a more serious situation than in the United States (2.0%), the United Kingdom (2.3%), and Sweden (3.7%) [8)]. Furthermore, depressive tendencies during pregnancy are also associated with the risk of preterm birth and low birth weight [9)10)], making early detection and prevention from the early stages of pregnancy essential.

Against this backdrop, screening for depressive tendencies in pregnant women and new mothers has been suggested to have the potential to reduce the prevalence of perinatal depression, regardless of whether treatment or additional support is provided[11)]. Among screening tools, the most widely used is the Edinburgh Postnatal Depression Scale (EPDS)[12)]. The EPDS was developed by Cox et al. for the purpose of screening for postpartum depression[12)], and its internal consistency as measured by Cronbach's alpha coefficient and validity have been verified across various countries during the broad period from pregnancy to the postpartum period. In Japan, Okuno et al [13)] created a Japanese version of the Edinburgh Postnatal Depression Scale (EPDS) in 1996, reporting that postpartum depression was defined as a cutoff score of 8/9 points with a 95% confidence interval, yielding a sensitivity of 75% and specificity of 93%. In Japan, organizations such as the Japan Society of Obstetrics and Gynecology/Japan Association of Obstetricians and Gynecologists [14)], the Japan Academy of Midwifery [15)], and the Japanese Society of Perinatal Mental Health [16)] also recommend using the EPDS for screening during pregnancy and the postpartum period.

According to an international review of the use of the EPDS during pregnancy, its sensitivity ranges from 64% to 100%, and its specificity ranges from 73% to 100%, with variations depending on the cutoff value and country [17)]. In Japan, Usuda et al [18)] reported a sensitivity of 90% and a specificity of 92% when using a cutoff value of 12/13 points for pregnant women between 12 and 24 weeks of gestation. Later studies have reported the use of a cutoff value of 8/9 points. The purpose of EPDS screening is to identify pregnant women with depressive tendencies at an early stage, and in many cases, a higher cutoff value with greater sensitivity is required.

As such, the application of EPDS cutoff values for prenatal use in Japan is not yet standardized and remains in a transitional phase. Therefore, this review aims to examine previous research on the use of the EPDS in Japanese pregnant women to clarify the current status of its timing and cutoff values in the corresponding period. This review seeks to contribute to improving the quality of depression screening during pregnancy in

future clinical practice and research.

II. Methods

1. Search Strategy and Keywords

A comprehensive literature search was conducted using the keywords: "Edinburgh Postnatal Depression Scale" OR "EPDS" AND "Japan" OR "Japanese." The databases searched included PubMed and EBSCO. The search was limited to peer-reviewed articles published in English between January 2018 and December 2024.

This time frame was selected because Usuda et al18). first reported the EPDS cutoff score for Japanese pregnant women in 2017, and we aimed to clarify how Later studies have addressed this issue.

2. Inclusion and Exclusion Criteria

The literature targeted was original research papers that met all of the following conditions:

- Focused on Japanese people
- Included pregnancy and conducted screening for depressive tendencies using the EPDS
- Clearly indicated the EPDS cutoff value
- Published in a peer-reviewed academic journal

On the other hand, studies that met the following criteria were excluded

- Focused on periods other than pregnancy (e.g., postpartum only)
- Studies using scales other than the EPDS
- Studies that do not clearly indicate the EPDS cutoff value

3. Study Selection Process

The selection process was conducted to ensure reproducibility and methodological rigor.

All retrieved articles were imported into RefWorks. The selection was conducted in two stages:

- In the first screening, titles and abstracts were reviewed.
- In the second screening, the full text of potentially relevant articles was obtained and assessed against the predefined inclusion and exclusion criteria.

4. Data Extraction and Management

Data extraction was conducted independently by two researchers using a standardized extraction form. The extraction items are as follows:

- Basic information on the study (author, year of publication, study design)
- Number of subjects and stage of pregnancy
- Timing of EPDS use and EPDS cutoff values during pregnancy
- Cronbach's alpha coefficient
- Rationale for setting EPDS cutoff values during pregnancy, etc.

These items were set based on the research questions of this study. The extracted data were organized and summarized in chronological order by publication year.

III. Results

1. Search results

The literature search yielded 154 hits on PubMed and 101 hits on EBSCO, for a total of 255 documents, including duplicates. Twenty-one documents were selected through a primary screening of titles and abstracts, and after careful reading of the full texts to ensure they met the inclusion and exclusion criteria, 12 documents were ultimately selected as

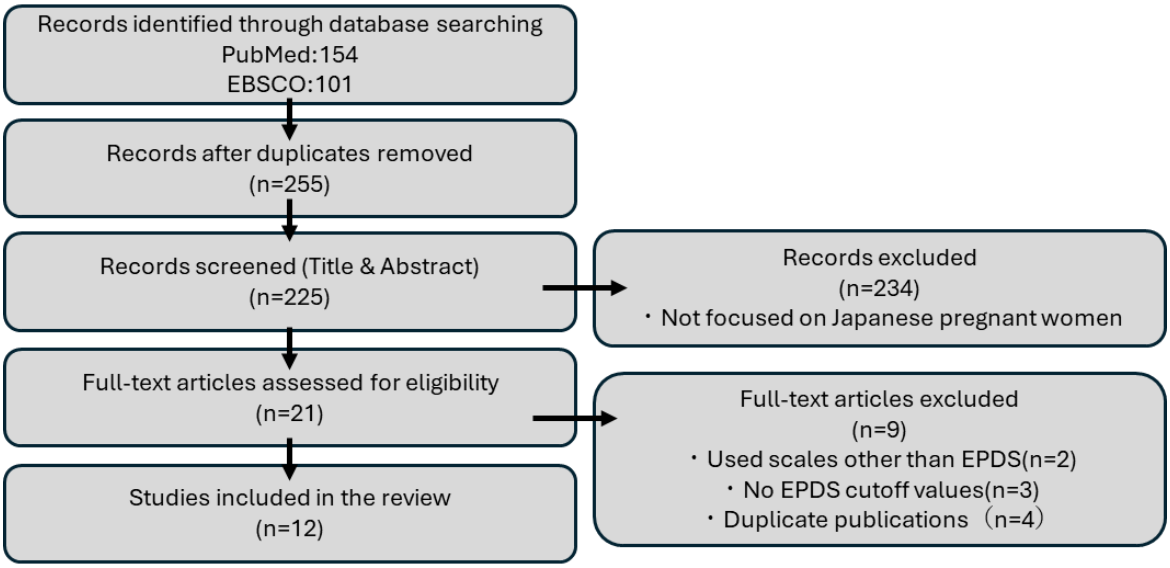

Figure 1.Flow of Study Selection

review papers for this study.

2. Study Design and Timing of Participant Enrollment

Among the 12 selected studies, 6 were longitudinal studies, 4 were cross-sectional studies, and 2 were cohort studies.

The gestational timing of EPDS administration (e.g., first, second, or third trimester) varied across studies, but all studies administered EPDS at some point during pregnancy. The methods of reporting the timing of administration fell into two categories: (1) studies that categorized pregnancy into trimesters (first, second, and third), and (2) studies that specified the exact gestational week.

Three studies 23),24),19) conducted surveys during the second and third trimesters of pregnancy. In contrast, some studies described the timing more broadly, such as “after 8 weeks of pregnancy” 26) and “after 12 weeks of pregnancy” 28).

Among the studies that specified gestational weeks, some conducted longitudinal assessments at 8–10 weeks, 24–26 weeks, and 35–36 weeks of pregnancy 29), while others focused on a broader range, such as 24–36 weeks 21). The EPDS was administered across all trimesters, though most studies concentrated on the second and third trimesters. Additionally, in 7out of the 12 studies 21), 22), 23), 24),27),29), and 20), the EPDS was also used postpartum-typically at one month after delivery-allowing for longitudinal evaluation from pregnancy through the postpartum period.

3. EPDS Cutoff Values and Rationale for Their Use in the Antenatal Period

The EPDS cutoff values used in the included studies were either ≥8 or ≥13 points. The most commonly used value was ≥9 points, reported in 7 studies (21, 22, 23, 24, 26, 27, and 29). No other cutoff values were used in the studies reviewed.

Among the 7 studies that covered both the antenatal and postpartum periods, 6 studies (21, 22, 23, 24, 27, and 29) applied a cutoff value of ≥9 points across both timeframes,

Table 1.Time Points and Cutoff Scores of the Edinburgh Postnatal Depression Scale (EPDS) Used in 12 Selected Studies

Authors	Study Design	Time Point	cutoff score	Cronbach's α	Rationale for the cutoff score
Yamauchi(2018)[21]	Longitudinal Study	24－36 weeks of gestation 1 month postpartum 4 months postpartum	≧9		based on Okano et al. (1996)
Teshigawara(2019)[22]	Longitudinal Study	during pregnancy 1 month postpartum	≧ 9		
Kubota(2020)[23]	Cross-sectional Study	second to third trimester of pregnancy or 1 month postpartum	≧9		based on Okano et al. (1996)
Baba(2020)[24]	Cohort Study	second to the third trimester of pregnancy 1 month postpartum	≧9		based on Okano et al. (1996)
Sato(2021)[25]	Cross-sectional Study	26－37weeks of gestation	≧13	0.82	based on Usuda et al. (2017)
Kachi(2021)[26]	Cross-sectional Study	After 8 weeks of gestation	≧9	0.87	cutoff based on JSOG*1 recommendation for clinical use
Suenaga(2022)[27]	Cross-sectional Study	8－36 weeks of gestation 2 days to less than 3 months postpartum	≧ 9	0.82	based on Okano et al. (1996)
Matsushima(2022)[28]	Cross-sectional Study	After 12 weeks of gestation	≧13		based on Usuda et al. (2017)
Tanuma(2022)[29]	Longitudinal Study	8－10weeks of gestation 24－26weeks of gestation 35－36weeks of gestation 3－4 days postpartum	≧ 9		based on Okano et al. (1996)
Ohsuga(2024)[30]	Cohort Study	before 12 weeks of gestation	≧13		
Watanabe(2024)[19]	Cross-sectional Study	second or third trimester	≧13		
Ohsuga(2024)[20]	Cohort Study	24－28weeks of gestation 1 month postpartum	antenatal period ≧13 postpartum period		

Blank spaces indicate that the information was not reported

*1 Japan Society of Obstetrics and Gynecology

while one study (20) used ≥13 points during pregnancy and ≥9 points postpartum.

Of the 5 studies focusing solely on the antenatal period, 4 studies (25, 28, 30, and 19) adopted a cutoff of ≥13 points, and one (26) used ≥9 points.

Eight of the 12 studies (21, 23, 24, 25, 26, 27, 28, and 29) provided a rationale for selecting their respective cutoff values in the antenatal period. The most frequently cited study was Okano et al.13), which first demonstrated the validity of the Japanese version of the EPDS in postpartum women, followed by Usuda et al 18), which validated the EPDS during pregnancy. Additionally, since EPDS cutoff values during pregnancy for pregnancy have not been established in Japan, 1 study 26) adopted EPDS cutoff values during pregnancy suitable for clinical use based on the recommendations of the Japanese Society of Obstetrics and Gynecology.

4. Cronbach's alpha coefficient

Among the 12 studies, three studies explicitly stated Cronbach's alpha coefficient 25), 26), (27), while many studies did not explicitly state psychometric internal consistency as measured by Cronbach's alpha coefficient. The Cronbach's alpha coefficient during pregnancy in the three studies was 0.82 or higher.

IV. Discussion

This study reviewed literature published between 2018 and 2024 targeting Japanese pregnant women to clarify the current status of the timing of EPDS use during pregnancy, EPDS cutoff values during pregnancy, internal consistency as measured by Cronbach's alpha coefficient, and rationale for setting EPDS cutoff scores during pregnancy. The results showed that all 12 studies included used EPDS as part of research rather than for clinical screening, and there was a lack of consistency in terms of timing of implementation, EPDS cutoff values during pregnancy, internal consistency as measured by Cronbach's alpha coefficient, and rationale for setting EPDS cutoff scores during pregnancy.

1. Variation in the Timing of EPDS Administration and the Need to Focus on Early Pregnancy

Most studies administered the EPDS during the second and third trimesters, while only two studies explicitly included women in the first trimester. However, prior research has shown that depressive symptoms in early pregnancy are associated with increased risks of postpartum depression and maternal suicide, highlighting the importance of mental health assessment during this critical period. Despite this, the current body of research is heavily concentrated on the mid-to-late stages of pregnancy. Implementing continuous screening beginning in the first trimester, along with accumulating evidence on its feasibility and utility, remains an area for future development. To adequately capture the trajectory of maternal mental health, trimester-specific assessments or evaluations aligned with gestational weeks are warranted.

2. Issues regarding the validity and rationale of EPDS cutoff values during pregnancy

Regarding EPDS cutoff values during pregnancy, variations were observed ranging from ≧9 points to ≧13 points. In particular,

studies that included both the pregnancy period and the postpartum period tended to use postpartum criteria (≧9 points). Since pregnancy involves psychological and physical changes that differ from those in the postpartum period, EPDS cutoff values during pregnancy should be considered specifically for pregnancy. Usuda et al [17] set the EPDS cutoff value at 12/13 points for pregnant women in their 12th to 24th weeks of pregnancy and reported a sensitivity of 90% and specificity of 92%. During pregnancy, hormonal changes, physical changes associated with fetal growth and changes in body image, physical strain, and preparation for new roles can lead to psychological changes at each stage of pregnancy, as well as emotional fluctuations and mental distress [31]. This suggests the need to consider cutoff-based evaluation criteria for depressive symptoms during pregnancy specific to pregnancy. Some studies included in this review also adopted a cutoff of ≧13 points, raising concerns about the possibility of missing pregnant women with mild depressive tendencies.

Regarding the basis for setting the cutoff value, multiple studies cited Okano et al's[13] validity study of the Japanese version of the EPDS, but this study primarily targeted postpartum women, limiting its direct applicability to pregnancy. On the other hand, as mentioned earlier, Usuda et al. reported a cutoff value based on evidence specific to pregnancy. Therefore, it is considered important to explicitly state a cutoff value suitable for pregnancy and to accumulate empirical research tailored to each stage of pregnancy.

3. Verification of internal consistency as measured by Cronbach's alpha coefficient

Only a limited number of studies explicitly stated Cronbach's alpha coefficient, a internal consistency as measured by Cronbach's alpha coefficient indicator for the EPDS, and there were few systematic verifications of the psychometric internal consistency as measured by Cronbach's alpha coefficient of the EPDS for Japanese pregnant women. While the internal consistency as measured by Cronbach's alpha coefficient of the EPDS is widely recognized internationally, considering the unique psychological characteristics of pregnancy, it was considered necessary to verify the validity and internal consistency as measured by Cronbach's alpha coefficient of the EPDS for each stage of pregnancy in Japan as well.

V. Conclusion

This study revealed, through a literature review on the use of the EPDS in Japanese pregnant women, that there is currently no standardization regarding the timing of administration, EPDS cutoff values during pregnancy, internal consistency as measured by Cronbach's alpha coefficient, or rationale for setting EPDS cutoff scores during pregnancy thresholds during pregnancy.

Pregnancy is a critical period for establishing the foundation of maternal and fetal health, and appropriate screening can lead to early detection and support. Going forward, it is essential to validate the validity and internal consistency as measured by Cronbach's alpha coefficient of the EPDS during pregnancy, establish optimal EPDS cutoff values during pregnancy based on sensitivity and specificity evaluations for each stage of pregnancy, and

establish a flexible evaluation system that takes into account the operational realities and cost-effectiveness of each facility in clinical implementation.

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Conflict of interest (COI)

No business enterprises, organisations, or groups related to COI were involved.

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