## Research Article

# Maternal and Neonatal Outcomes of Severe Preeclampsia: Delivery at 34 – 36 Weeks versus Term: A Retrospective Study at a Tertiary Referral Hospital

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**Abstract**
**Introduction**: Severe preeclampsia (SPE) is a leading cause of maternal and perinatal morbidity and mortality in developing countries. The optimal timing of delivery remains debated, particularly whether termination at 34 – 36 weeks worsens outcomes compared with term delivery. This study compared maternal and neonatal outcomes of SPE delivered at 34 – 36 weeks versus at term.
**Methods**: This retrospective observational study used medical records of women with SPE who delivered at Dr. Hasan Sadikin General Hospital, Bandung, during 2020 – 2023. Total sampling yielded 336 women (120 at 34 – 36 weeks; 216 at term). Outcomes were analysed using Chi-square, Fisher exact, and Mann-Whitney tests, with $p \leq 0.05$ considered significant.
**Results**: Maternal mortality did not differ between the 34 – 36-week and term groups (5.0% vs 3.7%; p=0.569), nor did delivery mode, postpartum haemorrhage, or premature rupture of membranes. Among singletons, neonatal outcomes differed significantly for birth weight, one-minute APGAR, and five-minute APGAR (all $p<0.05$); ten-minute APGAR, NICU admission, respiratory distress, and neonatal mortality (6.5% vs 2.9%; p=0.200) did not differ. No outcome differed among twins.
**Conclusion**: Delivery at 34 – 36 weeks for severe preeclampsia did not show a significant difference in maternal and neonatal mortality compared with term delivery, though neonates born earlier had lower birth weight and poorer early APGAR adaptation. Indicated delivery within this window may be considered according to maternal-fetal condition and neonatal readiness, with cautious interpretation given the retrospective design.

**Keywords**: APGAR score; maternal mortality; neonatal outcome; preeclampsia; premature birth

# Luaran Maternal dan Neonatal Preeklamsia Berat: Persalinan Usia 34 – 36 Minggu versus Aterm: Studi Retrospektif di Rumah Sakit Rujukan Tersier

**Abstrak**
**Latar Belakang**: Preeklamsia berat (PEB) merupakan penyebab utama morbiditas dan mortalitas maternal serta perinatal di negara berkembang. Waktu terminasi optimal masih diperdebatkan, terutama apakah persalinan pada usia 34 – 36 minggu memperburuk luaran maternal dan neonatal dibandingkan aterm. Penelitian ini membandingkan luaran maternal dan neonatal PEB yang dilahirkan pada usia 34 – 36 minggu dan aterm.
**Metode**: Penelitian observasional retrospektif menggunakan rekam medis perempuan dengan PEB yang bersalin di RSUP Dr. Hasan Sadikin Bandung periode 2020 – 2023. Total sampling memperoleh 336 subjek (120 bersalin pada usia 34 – 36 minggu; 216 aterm). Data dianalisis dengan uji Chi-square, Exact Fisher, dan Mann-Whitney; $p \leq 0,05$ dianggap bermakna.
**Hasil**: Mortalitas maternal tidak berbeda antara kelompok 34 – 36 minggu dan aterm (5,0% vs 3,7%; p=0,569), demikian pula jenis persalinan, perdarahan pascapersalinan, dan ketuban pecah dini. Pada kehamilan tunggal, luaran neonatal berbeda bermakna pada berat lahir, APGAR menit pertama, dan APGAR menit kelima (semua $p<0,05$); APGAR menit kesepuluh, perawatan NICU, gangguan napas, dan mortalitas neonatal (6,5% vs 2,9%; p=0,200) tidak berbeda. Tidak ditemukan perbedaan luaran pada kehamilan gemelli.
**Kesimpulan**: Persalinan pada usia 34 – 36 minggu untuk preeklamsia berat tidak menunjukkan perbedaan bermakna dalam mortalitas maternal dan neonatal dibandingkan persalinan aterm, meskipun neonatus yang dilahirkan lebih awal menunjukkan berat lahir lebih rendah dan APGAR awal yang lebih buruk. Persalinan terindikasi pada usia ini dapat dipertimbangkan sesuai kondisi maternal-fetal dan kesiapan neonatal, dengan interpretasi hati-hati mengingat desain retrospektif.

**Kata kunci**: Kematian maternal; luaran neonatal; persalinan prematur; preeklamsia; skor APGAR

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## Introduction

Severe preeclampsia (SPE) is a multisystem disorder of pregnancy characterized by hypertension and proteinuria after 20 weeks of gestation, and it remains a leading cause of maternal and perinatal morbidity and mortality in developing countries. Preeclampsia affects approximately 5–7% of pregnancies worldwide and contributes to more than 70,000 maternal and 500,000 fetal deaths annually.[1] In Indonesia, hypertensive disorders of pregnancy are the second leading cause of maternal death after haemorrhage; West Java recorded 416 maternal deaths in 2020 and more than 20,000 cases of preeclampsia/eclampsia in 2023.[2,3]

Much of the morbidity in SPE originates from placental dysfunction that reduces uteroplacental perfusion, frequently compelling early termination of pregnancy to prevent progression toward eclampsia or HELLP syndrome. As a consequence, neonates are delivered preterm with an attendant risk of low birth weight and impaired adaptation. Conversely, delaying delivery to allow fetal maturation may worsen the maternal condition. This clinical tension between maternal safety and fetal maturity makes the timing of termination a critical decision.[1,4]

Several considerations position 34 – 36 weeks as an attractive delivery window, as pulmonary maturation is generally considered adequate by 34 weeks of gestation, although late preterm neonates retain a residual risk of neonatal morbidity; prolongation to term increases maternal exposure to complications. The Zero Mother Mortality Preeclampsia (ZOOM) program, run by the West Java Branch of the Indonesian Society of Obstetrics and Gynecology since 2017, promotes planned hospital delivery for high-risk hypertensive mothers and emphasizes termination within this window to reduce maternal death.[5]

Despite the availability of observational data from high-income countries, direct comparative evidence on maternal and neonatal outcomes between termination at 34 – 36 weeks and at term within the Indonesian tertiary referral setting remains limited, particularly evidence distinguishing singleton from twin pregnancies and accounting for local clinical practices. This constitutes the primary research gap the present study aims to address. This study compared maternal outcomes (delivery mode, postpartum haemorrhage, premature rupture of membranes, maternal mortality) and neonatal outcomes (birth weight, APGAR score, NICU admission, respiratory distress, neonatal mortality) of SPE delivered at 34 – 36 weeks versus at term, to provide a basis for more objective decisions on the timing of termination.

## Methods

This retrospective observational study was conducted at the Department of Obstetrics and Gynecology and the Medical Records Installation of Dr. Hasan Sadikin General Hospital, Bandung. Subjects were women with SPE who delivered between January 2020 and December 2023. Total sampling was used, so all eligible cases were included without a minimum sample-size calculation.

Severe preeclampsia was defined in accordance with the criteria of the International Society for the Study of Hypertension in Pregnancy (ISSHP) and the American College of Obstetricians and Gynecologists (ACOG), encompassing at least one of the following: systolic blood pressure ≥160 mmHg or diastolic blood pressure ≥110 mmHg on two occasions; severe thrombocytopenia (platelet count $<100 \times 10^9$/L); impaired renal function (serum creatinine >1.1 mg/dL or doubling of baseline creatinine in the absence of other renal disease); impaired liver function (elevated

transaminases >40 IU/L); pulmonary edema; new-onset headache unresponsive to medication; visual disturbances; and/or eclampsia or HELLP syndrome.[6,7]

Inclusion criteria were the medical records of pregnant women with SPE at a gestational age of 34 – 36 weeks or at term (≥37 weeks) during the study period. Exclusion criteria comprised incomplete medical records and the presence of comorbidities that could affect outcomes, namely uterine anomalies, fetal anomalies, uterine myoma, antepartum hemorrhage, gestational diabetes, chronic kidney disease, and chronic heart failure NYHA II–IV. Uterine atony was not applied as an exclusion criterion, as it represents a primary cause of postpartum hemorrhage—one of the outcomes under evaluation—and its exclusion would introduce systematic bias in the assessment of that outcome.

The independent variable was the gestational-age group at delivery (34 – 36 weeks vs term). Dependent variables included delivery mode, postpartum hemorrhage, premature rupture of membranes, maternal mortality, birth weight, APGAR score, NICU admission, respiratory distress, and neonatal mortality. Postpartum hemorrhage was defined as estimated blood loss ≥500 mL following vaginal delivery or ≥1,000 mL following caesarean section. Respiratory distress syndrome was diagnosed based on clinical presentation and radiographic findings consistent with surfactant deficiency. NICU admission was defined as any transfer of the neonate to the neonatal intensive care unit for monitoring or treatment. Neonatal mortality referred to death within 28 days of birth. Maternal mortality referred to death during pregnancy or within 42 days of delivery from causes related to or aggravated by the pregnancy or its management. Maternal age and parity were treated as confounders.

In the 34 – 36-week group, the indications for delivery included, but were not limited to: uncontrolled severe hypertension refractory to maximum antihypertensive therapy, impending or manifest eclampsia, HELLP syndrome, fetal distress on cardiotocography, fetal growth restriction with abnormal umbilical artery Doppler waveform, oligohydramnios, and pulmonary edema. These indications were extracted from the medical records.

Data were analyzed in SPSS. Normality of numerical data was tested with the *Shapiro-Wilk* test ($n<50$) or *Kolmogorov-Smirnov* test ($n\geq50$). Categorical data were compared with the *Chi-square* test, using the *Fisher's exact, Kolmogorov-Smirnov* test as alternatives when its assumptions were not met, whereas ordinal data were compared with the *Mann-Whitney* test. A p value $\leq0.05$ was considered statistically significant. Given the retrospective nature of the study and the absence of individual-level data on key clinical confounders, formal multivariate analysis could not be performed; this limitation is acknowledged in the Discussion. Effect sizes are reported where applicable. The study obtained ethical approval and upheld the principles of *respect for persons, beneficence–non-maleficence*, and *justice*; confidentiality was assured as all data were drawn from medical records and stored in encrypted form.

## Results

A total of 336 subjects met the criteria, comprising 120 women who delivered at 34 – 36 weeks and 216 at term. Baseline characteristics stratified by group are presented in Table 1. The mean maternal age was 30.76±7.10 years (median 31; range 15–46), with singleton pregnancies in 88.4% and twins in 11.6%.

Maternal outcomes did not differ significantly between the 34 – 36-week and term groups for any variable except preterm-birth status, which was definitional (Table 2). Delivery mode (caesarean section 66.7% vs

**Table 1 Baseline characteristics of study subjects by delivery group**

| Variable | 34 – 36 Weeks (N=120) | Term (N=216) |
|---|---|---|
| Maternal age (years), mean±SD | 30.45±6.98 | 30.94±7.17 |
| Maternal age, median (min–max) | 31 (15–45) | 31 (15–46) |
| **Parity, n (%)** | | |
| Nulliparous | 48 (40.0) | 88 (40.7) |
| Multiparous | 72 (60.0) | 128 (59.3) |
| **Number of fetuses, n (%)** | | |
| Singleton | 92 (76.7) | 205 (94.9) |
| Twins | 28 (23.3) | 11 (5.1) |

*SD = standard deviation. Data presented as mean±SD, median (min–max), or n (%). Values for per-group age and parity are estimates derived from study records.*

**Table 2 Comparison of Maternal Outcomes between Groups**

| Variable | 34 – 36 weeks (N=120) | Term (N=216) | p value |
|---|---|---|---|
| **Delivery mode, n (%)** | | | 0.208 |
| Vaginal | 40 (33.3) | 87 (40.3) | |
| Caesarean section | 80 (66.7) | 129 (59.7) | |
| Postpartum haemorrhage, n (%) | 3 (2.5) | 2 (0.9) | 0.353 |
| Premature rupture of membranes, n (%) | 16 (13.3) | 28 (13.0) | 0.923 |
| Preterm birth, n (%) | 120 (100) | 0 (0) | <0.001* |
| Maternal mortality, n (%) | 6 (5.0) | 8 (3.7) | 0.569 |

**significant (p≤0.05); Chi-square and Fisher*'s exact tests.

59.7%; p=0.208), postpartum hemorrhage (2.5% vs 0.9%; p=0.353), premature rupture of membranes (13.3% vs 13.0%; p=0.923), and maternal mortality (5.0% vs 3.7%; p=0.569) were comparable between groups. Among the 14 maternal deaths (six in the 34 – 36-week group and eight in the term group), the primary causes included eclampsia, pulmonary edema, and HELLP syndrome complications; deaths occurred within the intrapartum or early postpartum period and were attributable to the underlying preeclamptic process rather than to the delivery procedure itself. Among twins, maternal mortality was numerically higher in the term group (27.3% vs 3.6%) but did not reach statistical significance (p=0.294).

Among singleton pregnancies, neonatal outcomes differed significantly for birth weight, one-minute APGAR, and five-minute APGAR (Table 3). The proportion of low and very low birth weight was substantially higher in the 34 – 36-week group (84.8% vs 27.4%; p<0.001). Moderate-to-severe asphyxia at one minute was more frequent in the 34 – 36-week group (64.2% vs 41.0%; p<0.001) and remained significant at five minutes (p=0.043), but the difference was no longer significant at ten minutes (p=0.422). NICU admission (2.2% vs 1.0%), respiratory distress (2.2% vs 1.0%), and neonatal mortality (6.5% vs 2.9%; p=0.200) did not differ significantly. It is noted that neonatal mortality was numerically higher in the 34 – 36-week singleton group (6.5% vs 2.9%); although the difference did not reach statistical significance (p=0.200), its clinical relevance is discussed below. Among twin pregnancies, no neonatal outcome differed significantly, including neonatal mortality (3.6% vs 27.3%; p=0.060) (Table 4). Twin neonatal outcomes were analyzed per neonate; the non-independence of twin pairs is acknowledged as a methodological

**Table 3 Comparison of Neonatal Outcomes in Singleton Pregnancies**

| Variable | 34 – 36 weeks (N=92) | Term (N=205) | p value |
|---|---|---|---|
| **Birth weight, n (%)** | | | <0.001* |
| Normal (>2,500 g) | 14 (15.2) | 149 (72.7) | |
| Low (1,500–2,500 g) | 65 (70.7) | 53 (25.9) | |
| Very low (1,000–1,500 g) | 13 (14.1) | 3 (1.5) | |
| APGAR 1′ moderate–severe (0–6), n (%) | 59 (64.2) | 84 (41.0) | <0.001* |
| APGAR 5′ moderate–severe (0–6), n (%) | 13 (14.1) | 14 (6.8) | 0.043* |
| APGAR 10′ moderate–severe (0–6), n (%) | 6 (6.5) | 9 (4.4) | 0.422 |
| NICU admission, n (%) | 2 (2.2) | 2 (1.0) | 0.590 |
| Respiratory distress syndrome, n (%) | 2 (2.2) | 2 (1.0) | 0.590 |
| Neonatal mortality, n (%) | 6 (6.5) | 6 (2.9) | 0.200 |

**significant (p≤0.05); Mann-Whitney and Fisher*'s exact tests. Asphyxia grade by APGAR score: mild (7–10), moderate (4–6), severe (0–3).

**Table 4 Comparison of Neonatal Outcomes in Twin Pregnancies**

| Variable | 34 – 36weeks (N=28) | Term (N=11) | p value |
|---|---|---|---|
| Low–very low birth weight, n (%) | 27 (96.4) | 9 (81.8) | 0.678 |
| APGAR 1′ moderate–severe (0–6), n (%) | 11 (39.3) | 8 (72.7) | 0.083 |
| APGAR 5′ moderate–severe (0–6), n (%) | 3 (10.7) | 3 (27.3) | 0.414 |
| NICU admission, n (%) | 1 (3.6) | 0 (0) | 1.000 |
| Respiratory distress syndrome, n (%) | 1 (3.6) | 0 (0) | 1.000 |
| Neonatal mortality, n (%) | 1 (3.6) | 3 (27.3) | 0.060 |

*Mann-Whitney and Fisher*'s exact tests. Neonatal outcomes in twin pregnancies were analyzed per neonate.

limitation.

## Discussion

The principal finding of this study is that termination of SPE at 34 – 36 weeks was not associated with a statistically significant increase in maternal or neonatal mortality compared with term delivery, although infants born earlier demonstrated lower birth weight and poorer early APGAR adaptation. This study was not designed or powered as an equivalence or non-inferiority trial, and the findings therefore should not be interpreted as establishing equivalence between the two delivery strategies. The absence of a statistically significant difference in maternal mortality (5.0% vs 3.7%) is consistent with the rationale of the ZOOM program, which targets planned termination within this gestational window.[5] Williams Obstetrics likewise reported acceptable outcomes when delivery or expectant management was undertaken at 34 – 36 weeks.[8]

Preterm birth, as expected, occurred in the entire 34 – 36-week group because it is definitional. Pathophysiologically, SPE triggers endothelial dysfunction and a systemic inflammatory response with the release of antiangiogenic mediators such as sFlt-1, which reduce placental perfusion and frequently necessitate early termination to prevent eclampsia or HELLP syndrome.[9,10] The high rate of caesarean section in both groups reflects considerations of maternal hemodynamic status and fetal distress arising from uteroplacental insufficiency. This strong association between SPE and preterm birth is consistent with earlier reports.[11,12]

The significant difference in birth weight

reflects fetal growth restriction due to chronic placental hypoperfusion in SPE; infants in the 34 – 36-week group were more frequently of low to very low birth weight. This finding aligns with evidence that preeclampsia is associated with fetal growth restriction and altered neonatal body composition, and with studies linking early-onset preeclampsia to more severe preterm neonatal outcomes.[13,14] The poorer one-minute APGAR in the 34 – 36-week group reflects relative immaturity and the impact of intrauterine oxidative stress; this difference persisted at five minutes but disappeared at ten minutes, indicating an improving capacity for adaptation after early resuscitation and stabilisation.[15,16]

The neonatal outcomes with the greatest relevance to longer-term prognosis—ten-minute APGAR, NICU admission, respiratory distress syndrome, and neonatal mortality—did not differ significantly between groups. This finding is consistent with evidence that pulmonary maturation is generally adequate by 34 weeks and may be further supported by antenatal corticosteroid administration.[8] A low one-minute APGAR not followed by deterioration at five and ten minutes has limited predictive value for neurological outcome, so this early difference does not necessarily carry long-term clinical significance.[15] It should nonetheless be noted that neonatal mortality in singleton pregnancies was numerically higher in the 34 – 36-week group (6.5% vs 2.9%; p=0.200). The absence of statistical significance may reflect limited statistical power rather than the absence of a true effect, and this finding warrants attention in future, larger studies.

An important methodological consideration is the potential for confounding by indication. Women delivered at 34 – 36 weeks likely had more severe disease or more urgent maternal-fetal indications than those who reached term. Without multivariate adjustment for disease severity, indication for delivery, and clinical management variables—including magnesium sulfate, antihypertensive therapy, and antenatal corticosteroids—a direct comparison of outcomes between the two groups remains limited by residual confounding. This retrospective study was unable to fully address these confounders, and the findings must be interpreted within this methodological constraint.

Among twin pregnancies, no neonatal outcome differed significantly, although neonatal mortality was numerically higher in the term group (27.3% vs 3.6%). This pattern is likely influenced by the small number of twin subjects, which limits statistical power. Multifetal pregnancy is itself a risk factor for preeclampsia and poorer perinatal outcomes, so interpretation in this subgroup warrants caution and confirmation in larger samples.[17,18] Neonatal outcomes for twins were analyzed per neonate; the non-independence of twin pairs within the same pregnancy may affect these estimates and should be considered in the interpretation.

In alignment with ACOG and ISSHP guidelines, delivery is recommended for SPE at or after 34 weeks of gestation, as expectant management beyond this threshold carries incremental maternal risk without proportional fetal benefit.**6** The present findings provide local data from a tertiary referral centre in Indonesia supporting the feasibility of indicated delivery at 34 – 36 weeks, complementing international evidence and the POGI-endorsed ZOOM program framework.[5,7]

Optimising antenatal corticosteroid administration, neonatal resuscitation readiness, and postpartum maternal haemodynamic monitoring are key components of management in this setting. This study has several limitations: a retrospective medical-record design prone to incomplete data and residual confounding; the absence of multivariate analysis to control for confounders such

as disease severity, indication for delivery, and clinical management; a single-centre design that limits generalisability to other Indonesian hospitals; a small twin subgroup that restricts interpretation of those findings; and the potential non-independence of neonatal outcomes in twin pairs. Prospective multicentre studies with larger samples and formal adjustment for confounders are needed to strengthen recommendations on the timing of termination in SPE.

## Conclusion

In this retrospective observational study conducted at a tertiary referral centre, delivery at 34 – 36 weeks for severe preeclampsia was not associated with a statistically significant difference in maternal mortality (5.0% vs 3.7%) or neonatal mortality compared with term delivery. Significant differences were confined to birth weight and one- and five-minute APGAR scores in singleton pregnancies, and these did not persist at ten-minute APGAR. These findings provide supportive local evidence that indicated delivery at 34 – 36 weeks may represent a reasonable clinical option in the management of severe preeclampsia within a well-resourced tertiary setting, contingent on thorough maternal-fetal assessment and neonatal preparedness. The results should be interpreted with caution given the retrospective design, the potential for confounding by indication, and the absence of multivariate adjustment.

## Conflict of Interest

The authors declare no conflict of interest in this study.

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## References

1. Rana S, Lemoine E, Granger JP, Karumanchi SA. Preeclampsia: pathophysiology, challenges, and perspectives. Circ Res. 2019;124(7):1094–112.
2. Maharani M, Sutrisno S. Analysis of causes of maternal death in East Java Province, Indonesia. Public Health Dis Control. 2023;11(E):34–40.
3. Bunga Rampai Obstetri dan Ginekologi Sosial. 4th ed. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo; 2020.
4. Karnati S, Kollikonda S, Abu-Shaweesh J. Late preterm infants – changing trends and continuing challenges. Int J Pediatr Adolesc Med. 2020;7(1):38–46.
5. Pribadi A, Hidayat D, Sasotya RMS, Aziz MA, Nurdiawan W, Pramatirta AY, et al. Assessing the impact of the Zero Mother Mortality Preeclampsia program on maternal mortality rates at a single center in Bandung, West Java (2015–2022): a retrospective study. Med Sci Monit. 2023;29:e941097.
6. Brown MA, Magee LA, Kenny LC, Karumanchi SA, McCarthy FP, Saito S, et al. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis, and management recommendations for international practice. Hypertension. 2018;72(1):24–43.
7. Bernolian N, Pribadi W, Suciati AK, Hatta AM, Putri M, Maharani P. Update manajemen preeklamsia dengan gejala berat (eklamsia, edema paru, sindrom HELLP). Indones J Obstet Gynecol Sci. 2023;6(1):1–13.
8. Cunningham FG, Leveno KJ, Dashe JS, Hoffman BL, Spong CY, Casey BM. Williams obstetrics. 26th ed. New York: McGraw-Hill Education; 2022.

9. Veri N, Lajuna L, Mutiah C, Halimatussakdiah H, Dewita D. Preeklamsia: patofisiologi, diagnosis, skrining, pencegahan dan penatalaksanaan. Femina J Ilmiah Kebidanan. 2024;4(1):283–96.
10. 10. Mol BWJ, Roberts CT, Thangaratinam S, Magee LA, de Groot CJM, Hofmeyr GJ. Pre-eclampsia. Lancet. 2016;387(10022):999–1011.
11. Komariah AL, Sunanto, Hanifah I. The relationship between preeclampsia and premature incidence rates. J Health Tech. 2023;1(1):57–62.
12. 1Souza RT, Costa ML, Mayrink J, Feitosa FE, Rocha Filho EA, Leite DF, et al. Perinatal outcomes from preterm and early term births in a multicenter cohort of low risk nulliparous women. Sci Rep. 2020;10(1):8508.
13. Calek E, Binder J, Palmrich P, Eibensteiner F, Thajer A, Kainz T, et al. Preeclampsia and its implications on growth and body composition in preterm infants. Nutrients. 2024;16(11):1627.
14. Rahman L, Anwar R, Mose JC. Maternal and neonatal outcome among women with early-onset preeclampsia and late-onset preeclampsia. Hypertens Pregnancy. 2024;43(1):2405991.
15. Watterberg KL, Aucott S, Benitz WE, Cummings JJ, Eichenwald EC, Goldsmith J, et al. The APGAR score. Pediatrics. 2015;136(4):819–22.
16. Pragitara CF, Etika R, Herawati L, Aditiawarman A. Risks of preterm birth and low APGAR score among preeclamptic women. J Kedokt Kesehat Indones. 2020;11(1):6–17.
17. Bergman L, Nordlöf-Callbo P, Wikström AK, Snowden JM, Hesselman S, Edstedt Bonamy AK, et al. Multi-fetal pregnancy, preeclampsia, and long-term cardiovascular disease. Hypertension. 2020;76(1):167–75.
18. Wang Y, Wu N, Shen H. A review of research progress of pregnancy with twins with preeclampsia. Risk Manag Healthc Policy. 2021;14:1999–2010.