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ORIGINAL RESEARCH ARTICLE

Postpartum Depression Risk and Associated Factors at a Midwifery Practice in South Kalimantan, Indonesia: A Cross-Sectional Screening Study

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ABSTRACT

Background. Postpartum depression (PPD) is among the most common psychiatric complications of childbirth, yet in many Indonesian primary-care settings it goes undetected.

Objective. To estimate the prevalence of PPD risk and its associations with maternal characteristics among postpartum women attending a community midwifery facility in South Kalimantan, Indonesia.

Methods. In this cross-sectional study, 30 postpartum women were screened consecutively between October and November 2025 with the 10-item Edinburgh Postnatal Depression Scale (EPDS). Scores were banded as none (0–4), low (5–9), moderate (10–12) and high (>12). Prevalence was estimated with Wilson 95% confidence intervals (CI). Associations with age, parity, education and occupation were tested with odds ratios (OR), Fisher's exact test, Firth-penalized logistic regression and Spearman correlation ($p < 0.05$).

Results. The mean EPDS score was 5.5 ± 3.0. Overall, 46.7% (95% CI 30.2–63.9) screened at risk (EPDS ≥5): 33.3% at low and 13.3% at moderate risk. In all, 13.3% (95% CI 5.3–29.7) reached the probable-depression threshold (≥10); none scored high. All four of these women were primiparas (4/13 versus 0/17 multiparas; Fisher exact $p = 0.026$). Lower maternal education correlated with higher symptom scores (Spearman $\rho = -0.36$, $p = 0.039$). Younger age (OR 4.44, 95% CI 0.82–23.95) and lower education (OR 2.73, 95% CI 0.65–11.55) showed positive but non-significant associations.

Conclusion. In this small single-site sample, nearly half of the women screened at risk and one in eight reached the probable-depression threshold. Routine EPDS screening with stepped referral in primary maternal care merits evaluation in larger, multi-site studies.

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1. Introduction

Childbirth is a major biological and psychosocial transition. For a sizable minority of women it brings clinically significant mood disturbance. Postpartum depression (PPD) is defined in the DSM-5 as a major depressive episode with peripartum onset, and ICD-11 lists it among the mental disorders associated with pregnancy and the puerperium. It is widely regarded as a common psychiatric complication of childbirth.[1,2] A large meta-analysis mapping the global prevalence of depression among postpartum women estimated a pooled figure of about 17.2% (95% CI 16.0–18.5), with wide variation across regions and income settings.[2] Reports from the Middle East and sub-Saharan Africa range from below 10% to above 50%, and screening instruments, cutoffs and sociocultural context differ between them.[3–5]

Several determinants of postpartum depressive symptoms recur across cultures. Deficient social and partner support, primiparity, inexperience with infant care, lower educational attainment, economic strain, unplanned pregnancy, obstetric complications, and a personal or family history of mood disorder are repeatedly reported as risk factors.[5–7] A multinational study identified maternal education, parity and perceived support as strong correlates of depressive symptoms,[7] and research on psychosocial predictors in

primiparous women describes the early puerperium as a window of heightened neurobiological and psychological vulnerability.[6] In this window, abrupt withdrawal of gonadal hormones, disrupted sleep and dysregulation of the hypothalamic-pituitary-adrenal axis interact with social adversity. In susceptible women, the result can be a depressive episode.

The effects reach beyond the mother. Untreated PPD lowers maternal quality of life and impairs the mother-infant relationship. It is also associated with shorter breastfeeding duration and with poorer cognitive, motor and socio-emotional development in the infant.[3,8,9] Depressed mothers often do not volunteer their distress. Stigma, limited mental-health literacy and fear of negative judgment impede help-seeking, so a large share of cases goes unrecognized.[10] Systematic screening offers a practical route to early identification. It allows timely psychosocial support and evidence-based dyadic interventions that reduce symptom severity.[11]

In Indonesia the burden of maternal mental disorder is considerable but poorly quantified. No dedicated national surveillance system tracks perinatal depression. Local studies report moderate depressive symptoms or postpartum blues in a sizeable share of puerperal women,[12–15] and digital and mobile adaptations of the EPDS are beginning to appear.[16] South Kalimantan faces particular challenges. Its population is dispersed and largely rural. New mothers are expected to cope privately within the extended family. Mental-health literacy about psychological adaptation in the puerperium is limited,[17] and mental-health services are poorly integrated into primary maternal care. Independent midwifery practices deliver much of the region's puerperal care, yet they rarely include structured psychological assessment.

Most Indonesian reports remain purely descriptive and seldom quantify uncertainty or effect sizes, and few come from independent primary-care settings in South Kalimantan. PPD is a treatable psychiatric disorder with measurable neurobiological correlates, and it can compromise maternal functioning and infant development.[1,2,8] This study therefore aimed to estimate the prevalence of postpartum depression risk and to examine its association with demographic and obstetric characteristics among postpartum women attending a community midwifery facility in South Kalimantan, using the EPDS.

2. Methods

2.1. Study design and setting

This was a descriptive, analytic cross-sectional study, reported in accordance with the STROBE recommendations. It took place at a primary-care independent midwifery practice (*Praktik Mandiri Bidan*) within the catchment of a community public health center in South Kalimantan, Indonesia. The facility provides antenatal, delivery, puerperal and family-planning services to a predominantly rural population. Facility name and location are withheld to preserve confidentiality.

2.2. Participants

Data were collected over two months, from October to November 2025. The source population was all postpartum women receiving puerperal care at the facility during this period. Consecutive sampling enrolled every eligible woman, which gave a final sample of 30 postpartum women. Women were eligible if they were postpartum, could communicate and read in Indonesian, and gave written informed consent. Exclusion criteria were active severe mental illness (for example psychosis or a manic episode), severe obstetric complications or critical medical illness, perinatal loss, serious cognitive or communication impairment, and withdrawal of consent.

The sample was the entire eligible puerperal population that presented in the enrollment window, and it was not based on a power calculation. With 30 participants, a single-proportion estimate has a maximum margin of error of about ±18 percentage points at 95% confidence. The study is therefore suited to descriptive estimation and hypothesis generation, not to confirmatory inference.

2.3. Variables and instruments

PPD risk was assessed with the EPDS, a 10-item self-report screening instrument developed by Cox and colleagues.[1] Each item covers the previous seven days. Scores run 0–3 per item (total range 0–30). The items capture three symptom domains: anhedonia, anxiety and depressed mood. The Indonesian-language version was used.[12,13] The instrument has shown acceptable screening performance in many languages and primary-care settings,[4,18,19] and the timing of administration affects detection.[20] Total scores were banded as no risk (0–4), low risk (5–9), moderate risk (10–12) and high risk (>12). Two thresholds defined a binary outcome where needed: an inclusive at-risk threshold (EPDS ≥5) and a probable-depression threshold (EPDS ≥10). In an individual-participant-data meta-analysis, a cutoff of ≥10 had a sensitivity of 0.85 and a specificity of 0.84 among studies using a semi-structured diagnostic interview (9,066 participants), and combined sensitivity and specificity were maximized at ≥11 overall.[21] Any positive response to item 10 (self-harm ideation) was flagged for immediate clinical attention. The total score did not matter.

Demographic and obstetric data came from a structured questionnaire: maternal age (banded <20, 20–35, >35 years), parity (1, 2, 3, 4), highest completed education (primary, junior secondary, senior secondary, tertiary) and occupation. For the bivariate and multivariable analyses, age was dichotomized as <25 versus ≥25 years, education as junior secondary or below (≤SMP) versus senior secondary or above (≥SMA), and occupation as homemaker versus employed outside the home. The dependent variable was EPDS-defined depression risk. The independent variables were the demographic and obstetric characteristics.

2.4. Data collection procedure

The EPDS and the structured questionnaire were administered at the facility.

2.5. Statistical analysis

Analyses were run in Python 3. Categorical variables are summarized as frequencies and percentages, and continuous variables as mean ± standard deviation. Prevalence of each EPDS band and of the binary thresholds is reported with Wilson-score 95% confidence intervals (CI). Bivariate associations with the at-risk outcome (EPDS ≥5) were quantified by odds ratios (OR) with 95% CI using the Haldane–Anscombe correction, by Fisher's exact test, and by Cramér's V as the effect-size measure (small ≈0.1, medium ≈0.3, large ≈0.5). The correction was applied to all comparisons although no cell was zero; the uncorrected ORs were 5.25 for age, 4.33 for homemaker status, 2.93 for education and 0.96 for parity. A multivariable Firth penalized-likelihood logistic regression, which suits small samples and quasi-separation, gave adjusted ORs, 95% CI and the Nagelkerke R^2. The outcome was common, so odds ratios overstate the corresponding prevalence ratios. They are read as indicating direction and strength of association only. Multicollinearity among predictors was low. Spearman rank correlation related maternal characteristics to the continuous EPDS score. The aim was exploratory. Several comparisons were made, so p values are interpreted descriptively and without multiplicity adjustment. Two-sided $p < 0.05$ was considered significant. Exact p values are given to three decimals.

2.6. Ethical approval

The study was approved by the Research Ethics Committee of the Institute for Research and Community Service (LPPM), Universitas Sari Mulia, Banjarmasin, Indonesia (Ethical Clearance No. 080/KEP-UNISM/I/2025, issued 19 January 2025). It followed the Declaration of Helsinki and the Indonesian National Guidelines on Health Research Ethics. All participants gave written informed consent. Data were anonymized, participation was voluntary with the right to withdraw, and any disclosure of self-harm ideation was referred for appropriate clinical care.

3. Results

Thirty postpartum women were enrolled (Table 1). Mean maternal age was 26.8 ± 4.1 years (range 18–36), and 28 women (93.3%) were aged 20–35 years. Primiparas numbered 13 (43.3%) and multiparas 17 (56.7%). Senior secondary education was the most common attainment (14 women, 46.7%), followed by junior secondary (10, 33.3%). Primary and tertiary education were each reported by 3 women (10.0%). Most women were homemakers (25, 83.3%).

Table 1. Demographic and obstetric characteristics of participants (n = 30).

Characteristic	Category	n	%
Maternal age (years)	<20	1	3.3
	20–35	28	93.3
	>35	1	3.3
Parity	1 (primipara)	13	43.3
	2	9	30.0
	3	5	16.7
	4	3	10.0
Education	Primary (elementary)	3	10.0
	Junior secondary (SMP)	10	33.3
	Senior secondary (SMA)	14	46.7
	Tertiary	3	10.0
Occupation	Homemaker	25	83.3
	Civil servant	3	10.0
	Private employee	1	3.3
	Entrepreneur	1	3.3

Notes: SMP, junior secondary school; SMA, senior secondary school.

The mean EPDS total score was 5.5 ± 3.0 (range 1–12). Table 2 gives the distribution: 16 women (53.3%; 95% CI 36.1–69.8) had no depressive risk, none (0%; 95% CI 0.0–11.4) were in the high-risk band, 14 women (46.7%; 95% CI 30.2–63.9) screened at risk on the inclusive threshold (EPDS ≥5), and 4 women (13.3%; 95% CI 5.3–29.7) met the probable-depression threshold (EPDS ≥10).

Table 2. Distribution of EPDS-defined postpartum depression risk categories (n = 30).

Risk category	EPDS score	n	%	95% CI (%)
No risk	0–4	16	53.3	36.1–69.8
Low risk	5–9	10	33.3	19.2–51.2
Moderate risk	10–12	4	13.3	5.3–29.7
High risk	>12	0	0.0	0.0–11.4
At risk (composite)	≥5	14	46.7	30.2–63.9
Probable depression	≥10	4	13.3	5.3–29.7

Notes: EPDS, Edinburgh Postnatal Depression Scale; CI, Wilson 95% confidence interval.

Table 3 summarizes the associations between maternal characteristics and the at-risk outcome (EPDS ≥5). Younger maternal age (<25 years) had the strongest association with screening at risk, although it was not significant (OR 4.44, 95% CI 0.82–23.95; Fisher p = 0.101; Cramér's V = 0.342). Homemaker status relative to employment outside the home came next (OR 3.24, 95% CI 0.44–23.98; p = 0.336; V = 0.239), followed by lower education at junior-secondary level or below (OR 2.73, 95% CI 0.65–11.55; p = 0.269; V = 0.261). Parity was not associated with the inclusive at-risk outcome (primipara versus multipara OR 0.97, 95% CI 0.24–3.93; p > 0.999; V = 0.009). Yet all four women who met the probable-depression threshold (EPDS ≥10; all in the moderate-risk band, 10–12) were primiparas, and no multipara reached it (4/13 versus 0/17; Fisher exact p = 0.026, computed from these counts). This exploratory observation suggests that parity may relate to symptom severity rather than to the presence of any elevated symptoms.

Table 3. Bivariate associations between maternal characteristics and at-risk EPDS (≥5).

Determinant (exposed vs reference)	At-risk, exposed	At-risk, reference	OR (95% CI)	p	Cramér's V
Younger age (<25 vs ≥25 y)	6/8 (75.0%)	8/22 (36.4%)	4.44 (0.82–23.95)	0.101	0.342
Homemaker vs employed outside	13/25 (52.0%)	1/5 (20.0%)	3.24 (0.44–23.98)	0.336	0.239
Lower education (≤SMP vs ≥SMA)	8/13 (61.5%)	6/17 (35.3%)	2.73 (0.65–11.55)	0.269	0.261
Primipara vs multipara	6/13 (46.2%)	8/17 (47.1%)	0.97 (0.24–3.93)	> 0.999	0.009

Notes: OR, odds ratio (Haldane–Anscombe corrected; uncorrected ORs 5.25, 4.33, 2.93 and 0.96); CI, confidence interval; p, Fisher's exact test; SMP, junior secondary school; SMA, senior secondary school. Odds ratios overstate prevalence ratios for this common outcome.

A Firth penalized-likelihood logistic regression for the at-risk outcome, including maternal age band and education (Table 4), gave an adjusted OR of 3.67 for younger age (<25 years; 95% CI 0.60–22.44; p = 0.159) and 2.20 for lower education (95% CI 0.46–10.46; p = 0.320). The model explained a modest share of variance (Nagelkerke R^2 = 0.194). No predictor reached statistical significance (Table 4), which fits the limited power of a 30-participant sample, and the estimates are exploratory.

Table 4. Multivariable Firth penalized-likelihood logistic regression for at-risk EPDS (≥5).

Predictor (vs reference)	Adjusted OR	95% CI	p
Younger age (<25 y vs ≥25 y)	3.67	0.60–22.44	0.159
Lower education (≤SMP vs ≥SMA)	2.20	0.46–10.46	0.320

Notes: Nagelkerke R^2 = 0.194; 14 at-risk women (events), n = 30. Estimates derive from a penalized-likelihood model appropriate for the small sample and are exploratory. OR, odds ratio; CI, confidence interval.

For the continuous EPDS score, lower maternal education was significantly associated with higher symptom scores (Spearman ρ = −0.36, p = 0.039; Figure 1). Scores rose stepwise from tertiary- and senior-secondary-educated mothers to those with primary and junior-secondary schooling. Maternal age correlated negatively with the EPDS score but not significantly (ρ = −0.29, p = 0.105), and parity was essentially uncorrelated (ρ = −0.05, p = 0.793). Elevated scores in this sample came mainly from the anhedonia and anxiety items (loss of enjoyment, self-blame and unprovoked worry) and not from the most severe depressive items. No participant endorsed active self-harm ideation on item 10 at a level requiring urgent escalation, although the protocol for immediate safety review stayed in force throughout. To summarize, most participants screened with no depressive risk (Table 2). Even so, nearly half carried at least subthreshold symptoms and one in eight reached the probable-depression threshold. Lower education was the only characteristic significantly correlated with the continuous EPDS score (Figure 1), whereas parity was associated with EPDS ≥10 in an exact test.

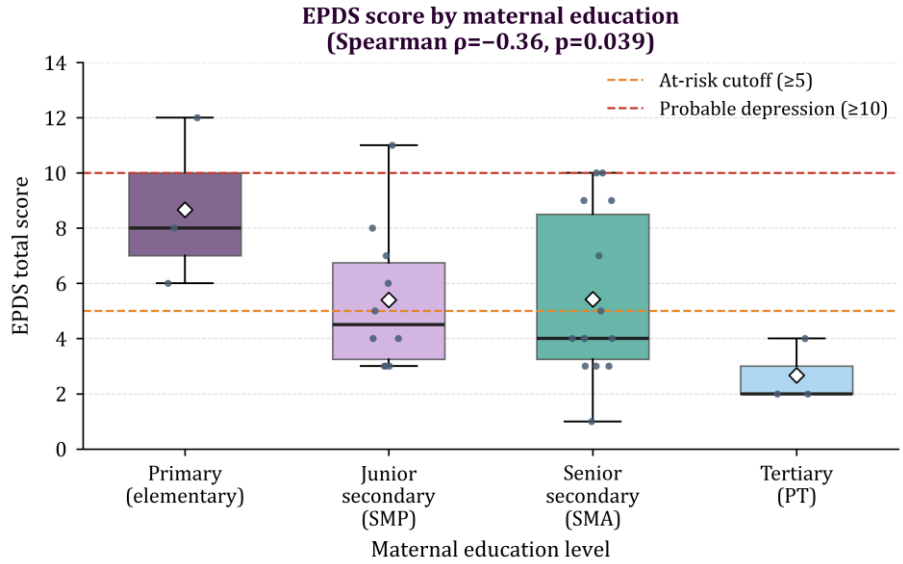


Figure 1. EPDS total score by maternal education level. Boxes show medians and interquartile ranges; diamonds show means; dots show individual scores (n = 30); dashed lines mark the at-risk (≥5) and probable-depression (≥10) thresholds. The primary-education box reflects three participants. EPDS, Edinburgh Postnatal Depression Scale; SMP, junior secondary school; SMA, senior secondary school; PT, tertiary education.

4. Discussion

4.1. Principal findings

In this cross-sectional screening study of 30 postpartum women at a community midwifery facility in South Kalimantan, 46.7% (95% CI 30.2–63.9) screened at risk on the EPDS (≥5) and 13.3% (95% CI 5.3–29.7) reached the probable-depression threshold (≥10) (Table 2). No woman scored in the high-risk band. Lower maternal education was significantly correlated with higher symptom scores (Figure 1), whereas younger age, homemaker status and lower education showed positive but non-significant associations with screening at risk (Table 3). All four women at or above the probable-depression threshold were primiparas. The estimates describe this facility and sample only. They are imprecise, and the associations are exploratory.

4.2. Comparison with the existing literature

The probable-depression prevalence of 13.3% lies within the global range and close to the pooled meta-analytic estimate of about 17.2%.[2] It is lower than several reports of moderate symptoms in Indonesian puerperal samples.[12,13] Several explanations are possible. The facility serves a population that was mostly multiparous and of reproductive age, screening took place early in the puerperium, and the banding scheme was inclusive. A cutoff of ≥10 was evaluated in an individual-participant-data meta-analysis,[21] and it gives the more conservative 13.3% figure here. Differences in screening instruments, cutoffs and sociocultural context make direct comparison across studies difficult,[3–5] and cutoffs must be stated openly when screening studies are compared.

The inverse relationship between maternal education and EPDS score (ρ = −0.36; Figure 1) agrees with international literature in which lower educational attainment predicts more perinatal depressive symptoms.[5,7] Education is often read as a proxy for health literacy, socioeconomic resources, problem-solving skills and the ability to find and use support services.[7,10] The odds ratios for younger age (OR 4.44) and homemaker status (OR 3.24) in Table 3 are in the direction reported in earlier work on youth and postpartum vulnerability,[6,19] but their confidence intervals include 1, and the small sample precludes firm inference.

4.3. Interpretation and mechanism

Parity behaved differently for the two outcomes. It was unrelated to the presence of any elevated symptoms (OR 0.97; Table 3), yet all four probable-depression cases were primiparas (Fisher exact p = 0.026). This is consistent with the documented vulnerability of first-time mothers, who face an abrupt move into the maternal role, inexperience with infant care and disrupted sleep.[6] With four cases and no adjustment, however, it remains a hypothesis that primiparity relates to escalation of symptoms rather than to their presence.

Biological factors have been proposed to destabilize mood in predisposed women during the early puerperium, in interaction with psychosocial adversity. They include the fall in estrogen and progesterone, changes in hypothalamic-pituitary-adrenal-axis activity, disrupted sleep and inflammatory change.[22] None of these factors, nor partner support, was measured here, so this study provides no evidence on mechanism. In a diathesis-stress account, the same hormonal milieu produces depression in some women and resilience in others, depending on their social and cognitive resources.[6,7]

The only significant correlate, maternal education, is a structural rather than a clinical variable. Perinatal mood disorders in non-Western, collectivist settings have been discussed through a biopsychosocial lens that weighs social determinants alongside neuroendocrine vulnerability, and screening programs that ignore

structural correlates risk under-serving the most disadvantaged women.

4.4. Implications for practice and policy

At a facility whose population appeared obstetrically low-risk, about one in two women carried detectable symptoms and one in eight a probable depressive disorder that may have gone unrecognized. Midwives can add the brief EPDS to routine puerperal visits, offer psychoeducation and support, and refer women above threshold for confirmatory assessment and for evidence-based psychological or dyadic intervention.[11,21] Any positive response to item 10 must trigger an immediate safety evaluation. A clear stepped-care pathway between midwifery practices and mental-health services would close a gap between detection and treatment.[10]

Cultural norms that frame maternal coping as a private family matter, together with stigma and limited mental-health literacy, may keep depressed mothers from disclosing their state or seeking help.[10,17] Routine screening presents mood assessment as a standard part of maternal care, and involving partners and extended family in psychoeducation could strengthen social support. Task-shifting, in which midwives screen, give first-line psychoeducation and triage, is endorsed in low- and middle-income settings. This study did not test its feasibility in South Kalimantan, and implementation studies are needed. Pairing screening with targeted psychoeducation for women with lower education and for first-time mothers could improve equity of detection. Placing screening within district maternal-and-child-health programs, with clear referral criteria and a designated mental-health contact, could turn opportunistic detection into a reliable stepped-care pathway. The EPDS is brief and freely available, so the additional cost of adding it to existing puerperal contacts would be small.

4.5. Strengths and limitations

Strengths include a widely used, internationally comparable instrument with a transparent banding scheme, prevalence reported with confidence intervals and effect sizes, penalized regression suited to small samples alongside exact tests, and scarce primary-care perinatal mental-health data from South Kalimantan. Several limitations temper interpretation. The cross-sectional design precludes causal inference and captures a single early-postpartum time point. A sample of 30 from one facility limits power and generalizability. The EPDS is a self-report screen that identifies risk, not diagnosis, and without a concurrent diagnostic interview accuracy metrics could not be estimated. Because the outcome was common, the odds ratios overstate prevalence ratios. Firth penalization guards against the inflation and separation that ordinary logistic regression would suffer at this sample size, but with 14 events and two predictors the multivariable estimates remain imprecise (Table 4). No multiplicity correction was applied, so the single significant correlation is hypothesis-generating until replicated. A sensitivity analysis at the stricter ≥10 threshold gave the same directional pattern, with risk concentrated among younger and primiparous women. Social and partner support, prior psychiatric history, pregnancy planning, mode of delivery and obstetric complications were not measured. Larger, multi-site, longitudinal studies that include these variables and a diagnostic reference standard are needed to estimate region-wide prevalence, to test the candidate determinants and to derive a locally validated cutoff. Longitudinal designs that screen repeatedly across the first postpartum year would capture symptom trajectories and separate transient adjustment reactions from persistent depression, and a structured diagnostic interview as reference standard would allow the local diagnostic accuracy of the EPDS to be estimated. Measuring validated psychosocial instruments would help disentangle the contributions of biological and social determinants.

5. Conclusion

Among postpartum women at a community midwifery facility in South Kalimantan, 46.7% (95% CI 30.2–63.9) screened at risk on the EPDS (≥5) and 13.3% (95% CI 5.3–29.7) reached the probable-depression threshold (≥10), with no high-risk cases. Lower maternal education was associated with higher symptom scores, and all four probable cases occurred in first-time mothers. Younger age showed a positive but non-significant association with screening at risk. These exploratory findings suggest that clinically relevant depressive risk can go undetected without systematic screening. Routine EPDS screening with a clear stepped-referral pathway in primary maternal care merits evaluation in adequately powered longitudinal studies that include psychosocial determinants and a diagnostic reference standard.

Declarations

Use of Generative Artificial Intelligence. None. The authors declare that no generative artificial intelligence tool was used in the conception, research, analysis, drafting, revision or preparation of this manuscript.

Author Contributions. S.N. — conceptualization, investigation, data curation, formal analysis, visualization, writing — original draft. D.R. — methodology, supervision, writing — review and editing. R.W. — validation, supervision, writing — review and editing. N.W.N. — investigation, resources, project administration. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Conflict of Interest. None. The authors declare that they have no competing interests, financial or non-financial, in relation to this work.

Ethical Approval. Approval was granted by the Research Ethics Committee of the Institute for Research and Community Service (LPPM), Universitas Sari Mulia, Banjarmasin, Indonesia, reference number 080/KEP-

UNISM/I/2025, on 19 January 2025. The study was conducted in accordance with the Declaration of Helsinki.

Informed Consent. Written informed consent was obtained from all participants prior to enrollment.

Data Availability. The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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