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Biopsychosocial Dimensions of Perinatal Anxiety in Primigravida Women at Primary Health Care

A Mixed Method Study

[1]Dea Pebrianti*, [2]Dyah Ayu Utari, [3]Ismarwati, [3]Cesa Septiana Pratiwi
Corresponding Author: * deapebrianti19@gmail.com
[1] Universitas Medika Suherman, Indonesia
[2] Universitas Muhammadiyah Kudus, Indonesia
[3] Universitas 'Aisyiyah Yogyakarta, Indonesia

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ABSTRACT

Perinatal anxiety among primigravida women is a significant yet frequently overlooked maternal mental health concern. This study analyzed the biopsychosocial dimensions of perinatal anxiety among primigravida women in primary health care settings using a sequential explanatory mixed methods design. The quantitative phase involved 171 primigravida women recruited through stratified proportional random sampling from two primary health care centers, who completed the Perinatal Anxiety Screening Scale (PASS). The qualitative phase included 15 informants with anxiety scores above 21 who participated in in-depth interviews. Quantitative data were analyzed using Chi-Square tests, while qualitative data were processed through NVivo 12 Plus following the Miles and Huberman framework. Ethical clearance was obtained from the Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta (No. 1453/KEP-UNISA/IV/2022). The results showed that 39.2% of respondents experienced anxiety (17.5% mild, 18.7% moderate, and 2.9% severe), with a significant association between gestational trimester and anxiety level ($p = 0.041$). The second trimester exhibited the highest proportion of anxiety at 56.0%. Qualitative analysis revealed three themes: forms of maternal discomfort, antenatal care access experiences, and biopsychosocial dimensions of anxiety encompassing biological, psychological, socioeconomic, environmental, and social support factors. Pearson correlation identified psychological factors ($r = 0.95$) and social support ($r = 0.85$) as dominant determinants. The biopsychosocial model proved effective as a comprehensive framework for understanding perinatal anxiety in primary care. These findings provide an evidence-based foundation

for holistic maternal mental health interventions and underscore the necessity of routine anxiety screening, strengthened counseling services, and structured social support programs within antenatal care.

Keywords
Biopsychosocial Model
Mixed Methods
Perinatal Anxiety
Primary Health Care
Primigravida

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Introduction

Pregnancy represents one of the most profound psychosocial transitions in a woman's life, characterized by complex physical, hormonal, and psychological changes that can significantly affect mental well-being [1]. Among pregnant women, primigravida mothers, those experiencing their first pregnancy, face unique challenges arising from the absence of prior pregnancy and childbirth experience, coupled with heightened uncertainty regarding fetal development, delivery processes, and the transition to motherhood [2]. This lack of experiential knowledge renders primigravida women particularly vulnerable to psychological distress, with perinatal anxiety emerging as a prevalent yet frequently underdiagnosed condition in maternal health care [3]. Perinatal anxiety, defined as excessive and persistent worry occurring during pregnancy and the postpartum period, has been associated with adverse maternal and fetal outcomes including preterm birth, low birth weight, preeclampsia, and postpartum depression [4].

Global prevalence estimates of perinatal anxiety range from 15% to 23% in general obstetric populations [3], though studies conducted in Asian countries during the recent global health crisis have reported substantially higher figures, with prevalence reaching 34% to 78% depending on measurement instruments and sociocultural contexts [5], [6]. Within this spectrum, primigravida status has been consistently identified as a significant risk factor for elevated anxiety levels compared to multigravida counterparts [7]. The biopsychosocial model, originally conceptualized by Engel in 1977, offers a comprehensive theoretical framework for understanding health and illness by integrating biological, psychological, and social determinants within an interconnected system [8].

In contemporary perinatal health research, this model has been expanded to encompass environmental factors and social support networks, providing a multidimensional lens through which to examine the complex etiology of perinatal anxiety [9]. Despite the theoretical robustness of this framework, empirical research applying the biopsychosocial model to

perinatal anxiety among primigravida women in Indonesian primary health care settings remains notably scarce. Existing studies within the country have predominantly employed quantitative cross-sectional designs with narrow variable scopes, typically examining one or two isolated factors without the integrative depth required to capture the full complexity of anxiety determinants [10], [11]. A recent cross sectional study by Darmayanti et al. in Banjarmasin applied a biopsychosocial approach to pregnancy anxiety but lacked qualitative depth and was limited to a single geographic location [12].

This methodological limitation represents a critical gap in the literature, as the lived experiences and contextual nuances that shape perinatal anxiety cannot be fully captured through quantitative measures alone [13]. Primary health care centers, known as Puskesmas in Indonesia, constitute the frontline of maternal health service delivery and serve as the principal setting for antenatal care (ANC) for the majority of pregnant women across the archipelago [14]. Within these settings, understanding the complete biopsychosocial profile of perinatal anxiety is essential for designing effective, sustainable, and culturally appropriate interventions. The sequential explanatory mixed methods design offers a methodologically rigorous approach to addressing this knowledge gap by combining quantitative hypothesis testing with qualitative exploration, allowing for triangulation and a more comprehensive understanding of the phenomenon under investigation [13]. This design enables researchers to first establish the prevalence and correlates of anxiety through standardized instruments, then deepen understanding through the voices and experiences of affected women. The urgency of this investigation is underscored by Indonesia's persistently high maternal mortality ratio and the disproportionate burden of untreated mental health conditions among pregnant women in resource-constrained settings. Current national maternal health programs emphasize physiological screening while psychological assessment remains optional and inconsistently implemented, leaving a substantial treatment gap. Furthermore, the absence of mixed methods evidence applying the biopsychosocial model specifically to primigravida women in Indonesian primary care limits the ability of policymakers and practitioners to develop targeted, evidence-based interventions. By integrating quantitative prevalence data with qualitative lived experiences, this study provides timely and actionable evidence to inform maternal mental health policy, strengthen antenatal care protocols, and reduce the burden of perinatal anxiety in similar low-resource settings.

The present study was conducted to analyze the biopsychosocial dimensions of perinatal anxiety among primigravida women attending antenatal care at primary health care centers. The specific objectives were: (1) to determine the profile of perinatal anxiety among primigravida women across the first, second, and third trimesters; (2) to analyze the association between gestational trimester and anxiety level; (3) to explain the biopsychosocial

dimensions of anxiety from a qualitative perspective; and (4) to formulate practical implications for maternal health services. The remainder of this article is structured as follows: the Literature Review section establishes the theoretical foundation for the biopsychosocial model in perinatal health; the Material and Methods section details the mixed methods sequential explanatory design, sampling procedures, instrumentation, and analytical approaches the Results and Discussions section presents integrated quantitative and qualitative findings with interpretative analysis; and the Conclusion section summarizes key contributions, acknowledges limitations, and offers recommendations for future research and practice.

Literature Review

A. Perinatal Anxiety: Conceptual Foundations and Prevalence

Perinatal anxiety encompasses a spectrum of anxiety disorders occurring during pregnancy and the first postpartum year, ranging from subsyndromal worry to clinical disorders including generalized anxiety disorder, panic disorder, and pregnancy specific anxiety [15]. Unlike the transient worry commonly experienced during normal pregnancy, pathological perinatal anxiety involves persistent, excessive apprehension that interferes with daily functioning and maternal fetal bonding [3]. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) recognizes anxiety during pregnancy as a clinically significant condition requiring assessment and intervention [15]. Epidemiologically, systematic reviews indicate that anxiety disorders affect approximately 15% to 23% of pregnant women worldwide, though measurement heterogeneity and cultural variations contribute to wide prevalence ranges [3]. Studies from Asian populations have reported notably higher rates. Sun et al. conducted a meta analysis involving 11,187 pregnant women across 15 studies during the COVID-19 pandemic and documented a pooled anxiety prevalence of 34% [5], while Maleki et al. reported that over 78% of pregnant women in Iran experienced severe anxiety during the same period [6]. These elevated figures underscore the importance of contextual factors in shaping maternal mental health outcomes.

The consequences of untreated perinatal anxiety extend beyond maternal psychological distress to encompass significant adverse fetal and child developmental outcomes. Corbett et al. demonstrated in a systematic review that antenatal anxiety is associated with increased risks of preterm delivery, low birth weight, reduced Apgar scores, and long-term neurodevelopmental alterations in offspring [4]. The biological mechanisms underlying these associations involve dysregulation of the maternal hypothalamic pituitary adrenal (HPA) axis, with elevated cortisol levels crossing the placental barrier and affecting fetal brain development [16]. Psychologically, anxious mothers exhibit reduced health-seeking behaviors, poorer medication adherence, and diminished capacity for prenatal attachment, creating a

cascade of negative consequences throughout the perinatal period [4]. Despite these well documented impacts, perinatal anxiety remains substantially underdiagnosed in routine antenatal care, particularly in resource limited primary care settings where mental health screening is not yet standardized practice [14].

B. The Biopsychosocial Model in Maternal Health

The biopsychosocial model, introduced by Engel in 1977 as an alternative to the reductionist biomedical model, posits that health and illness result from dynamic interactions among biological, psychological, and social systems [8]. This framework has proven particularly valuable in perinatal health, where pregnancy inherently involves the simultaneous interplay of physiological changes, psychological adaptation, and social role transitions [9]. Contemporary extensions of the model incorporate environmental influences and social support networks as additional determinants, creating a five dimensional framework that more fully captures the complexity of maternal mental health [9]. In the context of perinatal anxiety research, the biopsychosocial model provides a theoretically sound structure for organizing the diverse risk and protective factors identified in the literature.

The biological dimension encompasses pregnancy complications, medical comorbidities, hormonal fluctuations involving progesterone, estrogen, and human chorionic gonadotropin, genetic predispositions, and physical symptoms including nausea, fatigue, and sleep disturbances [17]. The psychological dimension includes cognitive patterns such as excessive worry and catastrophic thinking, emotional states including fear and sadness, prior mental health history, and personality traits such as perfectionism and need for control [18]. The socioeconomic dimension incorporates income stability, employment status, educational attainment, pregnancy planning status, and access to healthcare resources [19]. The environmental dimension comprises social stigma, negative assumptions from community members, family pressures, and the quality of the immediate physical and social environment [16], [19]. Finally, the social support dimension captures emotional, instrumental, informational, and appraisal support from spouses, family members, friends, and healthcare providers [20]. Research consistently demonstrates that robust social support functions as a protective factor against perinatal anxiety, while its absence constitutes a significant risk factor [21].

C. Mixed Methods Research in Midwifery and Maternal Health

Mixed methods research, defined as the integration of quantitative and qualitative approaches within a single study, has gained increasing recognition in health sciences for its capacity to address complex research questions that cannot be adequately answered through mono method designs [13]. The sequential explanatory design, wherein quantitative data collection and analysis precede qualitative phases, is particularly suited for studies seeking to

both measure the extent of a phenomenon and explain the mechanisms underlying observed patterns [13]. In maternal health research, this approach allows investigators to establish the prevalence and correlates of conditions such as perinatal anxiety while simultaneously exploring the lived experiences, meanings, and contextual factors that quantitative instruments cannot capture [22]. Creswell and Creswell emphasize that the explanatory variant of sequential designs specifically positions the qualitative phase to help explain, elaborate on, or clarify quantitative findings, making it ideal for studies where statistical results require deeper interpretation [13].

The Perinatal Anxiety Screening Scale (PASS), developed by Somerville et al. in 2014, represents one of the most comprehensive instruments for assessing anxiety symptoms during the perinatal period [23]. The instrument comprises 31 items organized across four domains: excessive worry and specific fears, perfectionism and control, social anxiety, and acute anxiety and adjustment [23]. In its original validation study, PASS demonstrated strong psychometric properties including a Cronbach's alpha of 0.86-0.90, sensitivity of 0.70, and specificity of 0.30, with statistically significant validity (p= 0.04) [23]. The scale has been translated and culturally adapted for use in multiple languages and has proven effective in identifying clinically significant anxiety across diverse populations [23].

D. Prior Research and Identified Gaps

Studies examining anxiety among pregnant women in Indonesia have predominantly employed quantitative cross-sectional designs with limited variable scopes. Hanifah identified a significant association between parity and prenatal anxiety with a p-value of 0.003, noting that primigravida women exhibited significantly higher anxiety levels due to their limited pregnancy experience [2]. Fatmasanti et al. similarly reported a significant relationship between parity and anxiety (p = 0.018) in their study of pregnant women [11]. More recently, Darmayanti et al. [12] applied a biopsychosocial framework to analyze pregnancy anxiety in Banjarmasin, identifying multiple associated factors across biological, psychological, and social domains. However, this study was limited by its cross-sectional design and lack of qualitative exploration, leaving the lived experiences and contextual interpretations of affected women unexplored. Internationally, studies by Ge et al. and Kajdy et al. have documented the multifactorial nature of perinatal anxiety during health crises, emphasizing the roles of social support deficits, economic uncertainty, healthcare access barriers, and pregnancy complications as interconnected determinants [19], [24]. Despite this growing evidence base, no prior study in Indonesia has applied the biopsychosocial model through a mixed methods sequential explanatory design to comprehensively examine perinatal anxiety among primigravida women in primary care settings. The present study addresses this gap by

integrating quantitative measurement with qualitative depth to produce a holistic understanding of anxiety determinants in this vulnerable population.

Material and Methods

A. Research Design

This study employed a mixed methods design with a sequential explanatory approach, following Creswell's theoretical framework for integrating quantitative and qualitative methods [13]. In this design, the quantitative phase (cross-sectional survey) was conducted first, followed by the qualitative phase (phenomenological in-depth interviews) to explain, elaborate on, and contextualize the quantitative findings [13]. The quantitative method served as the dominant approach, while the qualitative method functioned to complement, deepen, and validate the numerical data [13]. This triangulated approach was selected because perinatal anxiety represents a complex phenomenon influenced by interconnected biopsychosocial factors that cannot be adequately understood through measurement alone. The sequential explanatory structure specifically allowed the research team to identify women with elevated anxiety scores and subsequently explore their experiences in depth, thereby connecting statistical patterns with personal meanings.

B. Setting and Time Frame

The research was conducted at two primary health care centers (Puskesmas) in the Special Region of Yogyakarta, Indonesia: Puskesmas Sleman in Sleman District and Puskesmas Sewon I in Bantul District. These locations were purposively selected because both districts recorded the highest antenatal care coverage in Yogyakarta Province. Puskesmas Sleman is an outpatient and inpatient community health center equipped with laboratory services, psychology clinic, maternal and child health (MCH) clinic, dental clinic, and nutrition services. Puskesmas Sewon I similarly provides obstetric care, ultrasonography (USG), KIA services, family planning, immunization, and psychology clinic services. Data collection occurred during April to May 2022, a transitional period as Indonesia moved from strict public health restrictions toward relaxed measures. This temporal context is acknowledged as a boundary condition of the study, and the biopsychosocial findings are interpreted as applicable beyond the specific health crisis period.

C. Population and Sampling

1. Quantitative Sample

The study population comprised all primigravida women attending antenatal care visits at both health centers. Based on preliminary surveys, the total population consisted of 309 primigravida women (104 at Puskesmas Sleman and 205 at Puskesmas Sewon I). The minimum sample size was calculated using Budiman's formula for finite populations, yielding a required sample of 171 respondents. Stratified proportional random sampling

was applied to ensure proportional representation from both locations, resulting in 58 respondents from Puskesmas Sleman and 113 from Puskesmas Sewon I. The inclusion criteria were: primigravida women in any trimester (first, second, or third) who voluntarily agreed to participate and completed the entire PASS questionnaire. The exclusion criteria were incomplete questionnaire responses or a documented diagnosis of severe mental illness (bipolar disorder or schizophrenia).

2. Qualitative Sample

The qualitative phase involved 15 informants selected through purposive sampling from among respondents who scored above 21 on the PASS (indicating at least mild anxiety). The selection criteria for informants included: complete survey data, anxiety score greater than 21, willingness to participate in interviews, and absence of severe psychiatric diagnoses verified through collaboration with the in house psychologist and medical records. Data saturation was reached when no new themes or sub themes emerged from successive interviews.

D. Research Instruments

The quantitative instrument was the Perinatal Anxiety Screening Scale (PASS), developed and validated by Somerville et al. [23]. The PASS contains 31 items rated on a 4-point Likert scale (0 = not at all, 1 = sometimes, 2 = often, 3 = nearly always), with a total score range of 0-93. The instrument covers four domains: (1) excessive worry and specific fears (items 1-10); (2) perfectionism, control, and trauma (items 11-18); (3) social anxiety (items 19-23); and (4) acute anxiety and adjustment (items 24-31). The anxiety categories are: not anxious (0-20), mild anxiety (21-26), moderate anxiety (27-40), and severe anxiety (41-93). The Indonesian language translation of PASS was completed by the Language Development Center of Universitas Aisyiyah Yogyakarta (No. 05/UNISA/PBB/1/2022) and reviewed by the research supervisor. Permission for instrument use was obtained from the Western Australian Department of Health.

The qualitative instruments comprised a semi structured indepth interview guide, audio recording equipment, field notes, and verbatim transcription protocols. The interview guide was developed based on quantitative findings and covered domains related to psychological experiences, pregnancy complaints, healthcare access, social support, and environmental stressors.

E. Ethical Considerations

The study received ethical approval from the Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta (No. 1453/KEP-UNISA/IV/2022). All participants provided written informed consent after receiving detailed explanations about the study purpose, procedures, risks, benefits, and their right to withdraw at any time. The ethical principles of

anonymity (data recorded using codes only), beneficence (maximizing benefits while minimizing risks), confidentiality (secure storage of all data), justice (equitable treatment of all participants), and respect for persons (autonomy and voluntary participation) were strictly maintained throughout the research process.

F. Data Collection Procedures

Quantitative data were collected through structured interviews using the PASS questionnaire administered by the researcher and trained assistants during routine antenatal care visits. Completed questionnaires were immediately checked for completeness and consistency. Qualitative data were collected through in-depth interviews lasting approximately 30-60 minutes each, conducted in a private setting at the health centers. All interviews were audio-recorded with participants' permission and transcribed verbatim for analysis.

G. Data Analysis

Quantitative data were analyzed using SPSS statistical software. Univariate analysis was conducted to describe the distribution of respondent characteristics and anxiety levels using frequencies and percentages. Bivariate analysis employed the Chi-Square test to examine the association between gestational trimester (independent variable) and anxiety level (dependent variable), with a significance level set at $p < 0.05$. Qualitative data were analyzed using NVivo 12 Plus software following the Miles and Huberman analytical framework, which involved three concurrent activities: data reduction, data display, and conclusion drawing. The coding process began with open coding, during which the first author read all transcripts repeatedly and assigned initial codes to meaningful text segments using NVivo's node creation function. These initial codes were then grouped into focused codes through constant comparative analysis, where similarities and differences across informant accounts were systematically examined. Focused codes were subsequently organized into categories and thematic matrices, enabling the identification of patterns and relationships. Twelve focused codes emerged from this iterative process, which were then aggregated into three overarching themes: forms of maternal discomfort, antenatal care access experiences, and biopsychosocial dimensions of anxiety. To quantify the relative prominence of each sub-theme within the qualitative data, Pearson correlation coefficients were computed within NVivo 12 Plus by correlating the frequency counts of coded references for each sub-theme with informants' PASS anxiety scores. This procedure transformed qualitative code frequency data into numerical values that could be statistically correlated, yielding coefficients that indicate the strength of association between each thematic dimension and reported anxiety levels. Data saturation was determined to have been reached after the 13th interview, as no new codes or themes emerged in the final two interviews, confirming thematic adequacy. The rigor of

qualitative findings was ensured through credibility (prolonged engagement of 30-60 minutes per interview, verbatim transcription, independent coding review by a second researcher, and supervisor consultation), transferability (thick description of participant contexts and settings), dependability (comprehensive audit trail documenting all analytical decisions), and confirmability (reflexivity journal maintained by the researcher, bracketing of preconceptions, and triangulation between qualitative themes and quantitative anxiety scores).

Results and Discussions

A. Quantitative Results

1. Respondent Characteristics

A total of 171 primigravida women participated in the quantitative phase. The demographic profile revealed that the majority of respondents (94.7%) were aged 20-35 years, which corresponds to the optimal reproductive age range. Educational attainment was predominantly at the senior high school level (66.1%), followed by university graduates (31.6%). Nearly half of the participants (48.0%) were housewives, while 38.0% worked in the private sector. The majority (77.6%) reported a monthly household income between 1 and 3 million Indonesian Rupiah. The distribution across trimesters was relatively balanced, with 37.4% in the first trimester, 29.2% in the second trimester, and 33.3% in the third trimester. Table 1 presents the complete characteristics of the respondents.

Table 1. Characteristics of Respondents (N = 171)

Characteristic	n	%
Age		
• < 20 years	9	5.3
• 20 - 35 years	162	94.7
Education		
• Low (Elementary/Junior High)	4	2.3
• Medium (Senior High)	113	66.1
• High (University)	54	31.6
Occupation		
• Housewife	82	48.0
• Civil servant	7	4.1
• Private employee	65	38.0
• Entrepreneur	12	7.0
• Others	5	2.9
Income		
• < 1 million IDR	13	7.6
• 1 - 3 million IDR	132	77.6
• > 3 million IDR	25	14.7
Gestational age		
• First trimester (1-13 weeks)	64	37.4
• Second trimester (14-27 weeks)	50	29.2
• Third trimester (28-41 weeks)	57	33.3

2. Distribution of Perinatal Anxiety Levels

The analysis of PASS scores revealed that 60.8% of respondents (n = 104) did not experience clinically significant anxiety, while 39.2% (n = 67) exhibited some level of anxiety. Among those with anxiety, 17.5% (n = 30) were classified as mild, 18.7% (n = 32) as moderate, and 2.9% (n = 5) as severe. Table 2 presents the distribution of anxiety levels across the sample.

Table 2. Distribution of Perinatal Anxiety Levels (N = 171)

Anxiety Level	Score Range	n	%
Not anxious	0 - 20	104	60.8
Mild anxiety	21 - 26	30	17.5
Moderate anxiety	27 - 40	32	18.7
Severe anxiety	41 - 93	5	2.9
Total with anxiety	21 - 93	67	39.2

The overall anxiety prevalence of 39.2% is consistent with meta-analytic findings from Asian populations during recent health crises, where pooled estimates reached 34% [5], while falling within the broader international range of 15% to 23% reported in non-crisis periods [3]. The predominance of moderate anxiety (18.7%) over mild (17.5%) and severe (2.9%) categories suggests that affected women experience clinically meaningful distress requiring intervention, yet most cases remain potentially manageable with appropriate counseling and support services.

3. Association Between Gestational Trimester and Anxiety

The Chi-Square test demonstrated a statistically significant association between gestational trimester and anxiety level (p= 0.041), leading to the rejection of the null hypothesis and acceptance of the alternative hypothesis that a relationship exists between these variables. The second trimester exhibited the highest proportion of anxiety at 56.0%, followed by the first trimester (32.8%) and the third trimester (31.6%). Table 3 presents the detailed cross-tabulation.

Table 3. Association Between Gestational Trimester and Anxiety Level

Trimester	Not Anxious n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Total n (%)	p-value
First (1-13 wk)	43 (67.2)	12 (18.8)	8 (12.5)	1 (1.6)	64 (100)	0.041
Second (14-27 wk)	22 (44.0)	11 (22.0)	16 (32.0)	1 (2.0)	50 (100)	
Third (28-41 wk)	39 (68.4)	7 (12.3)	8 (14.0)	3 (5.3)	57 (100)	
Total	104 (60.8)	30 (17.5)	32 (18.7)	5 (2.9)	171 (100)	

The finding that the second trimester registered the highest anxiety proportion is particularly noteworthy because it contradicts the commonly held assumption that the third trimester represents the peak period of pregnancy-related anxiety [7]. The elevated

anxiety during the second trimester may be attributed to several interconnected factors: the visibility of pregnancy becomes more pronounced during this period, triggering increased social scrutiny and commentary; screening procedures for fetal anomalies create anticipatory anxiety; hormonal fluctuations reach their zenith; and women transition from initial pregnancy excitement to more realistic concerns about labor preparation and parenting readiness [18]. Additionally, the social evaluation inherent in second-trimester pregnancy where the pregnancy becomes publicly visible but the certainty of outcomes remains incomplete may activate social anxiety pathways that are particularly salient for primigravida women navigating their first experience of public maternal identity [20].

B. Qualitative Results

1. Informant Characteristics

Fifteen informants participated in the qualitative phase, selected from among respondents who scored above 21 on the PASS. The profile of informants was predominantly moderate anxiety (10 informants), followed by mild anxiety (4 informants) and severe anxiety (1 informant). The majority were in their second trimester (9 informants), consistent with the quantitative finding that this trimester exhibited the highest anxiety prevalence. Informants were identified by coded designations (IF1 through IF15) to ensure anonymity.

2. Thematic Analysis

Analysis of in-depth interview data using NVivo 12 Plus yielded three overarching themes and twelve sub-themes that collectively illuminate the biopsychosocial dimensions of perinatal anxiety among primigravida women. Table 4 presents the complete thematic structure with corresponding Pearson correlation coefficients for the relationship between each sub-theme and anxiety experience.

Table 4. Themes and Sub-themes from Qualitative Analysis

Theme	Sub-theme	Pearson r	Description
Theme 1: Forms of maternal discomfort	1. Psychological factors	0.95	Overthinking, emotional lability, excessive fetal worry, cognitive decline, panic
	2. Pregnancy complaints	-	Nausea, vomiting, dizziness, physical changes
	3. Sleep quality	-	Discomfort positioning, nocturia, insomnia
Theme 2: Antenatal care access experience	1. Impact of health crisis	0.76	Fear of facility visits, family COVID-19 history
	2. ANC service changes	-	Reduced dental care, referral protocols, restricted visits
	3. Health access efforts	-	Telemedicine, pregnancy applications, YouTube
	4. Psychologist consultation	0.76	Relief, confidence building, emotional validation

Theme	Sub-theme	Pearson r	Description
Theme 3: Biopsychosocial dimensions	1. Biological factors	-	Anemia, hemorrhoids, IUGR, physical complications
	2. Social support	0.85	Spousal support, healthcare provider support
	3. Socioeconomic factors	-	Financial concerns, unplanned pregnancy
	4. Environmental factors	-	Social stigma, negative neighborhood assumptions
	5. Maternal expectations	-	Desire for longer counseling, friendlier providers

Discussion

A. Theme 1: Forms of Maternal Discomfort

The first theme captures the immediate experiential manifestations of anxiety among primigravida women. The psychological factors sub theme exhibited the highest Pearson correlation coefficient (r=0.95), establishing it as the dominant dimension of anxiety experience. Informants described a pervasive pattern of overthinking about fetal health, emotional lability, catastrophic worry about pregnancy outcomes, perceived cognitive decline in processing and decision-making, and occasional panic episodes. These findings align with Smorti et al., who identified psychological flexibility and emotional regulation as key mediators of pregnancy anxiety [18]. The primigravida status appears to amplify these psychological manifestations because first-time mothers lack experiential referents for distinguishing normal pregnancy concerns from pathological anxiety, creating a feedback loop where uncertainty breeds further worry. Pregnancy related physical complaints including nausea, vomiting, dizziness, and body changes constituted the second sub-theme, while sleep quality disturbances related to physical discomfort and frequent urination formed the third sub-theme. Although these somatic factors did not demonstrate the same statistical strength as psychological factors, they functioned as important amplifiers of anxiety by providing constant physical reminders of vulnerability [26].

B. Theme 2: Antenatal Care Access Experience

The second theme reflects the interface between healthcare system characteristics and maternal anxiety. The impact of the health crisis sub-theme showed a moderate correlation (r = 0.76) with anxiety experience. Informants reported fear of visiting healthcare facilities due to infection risk, particularly when family members had experienced COVID-19. Changes in ANC service delivery including reduced dental care, restricted companion policies, and modified referral protocols for symptomatic patients created additional stress by disrupting expected care patterns [18], [27]. However, informants also actively engaged in health-seeking through alternative channels including telemedicine consultations via Alodoc, educational content on YouTube, and pregnancy applications. Notably, access to psychologist consultation at the health centers emerged as a protective factor with a correlation of 0.76, with informants

reporting feelings of relief and increased confidence following counseling sessions. This finding suggests that psychological support integrated into routine antenatal care can serve as a meaningful buffer against anxiety, even in resource constrained settings. The current brevity of counseling sessions (10-15 minutes) was identified as insufficient by several informants, who expressed a desire for more comprehensive psychological support.

C. Theme 3: Biopsychosocial Dimensions

The third theme encompasses the five-dimensional biopsychosocial framework and represents the core integrative finding of the study. As shown in Table 3, anxiety was distributed unevenly across trimesters, with the second trimester showing the highest proportion (56.0%), followed by the first (32.8%) and third (31.6%). This quantitative pattern is qualitatively explained by the convergence of physical symptom intensification, social scrutiny escalation, and psychological stress accumulation that characterizes the mid-pregnancy period. The social support sub-theme demonstrated the second highest correlation coefficient ($r = 0.85$), underscoring its critical role in anxiety determination. Informants described spousal support in both instrumental forms (assistance with household tasks) and emotional forms (attention, reassurance, and companionship) as their primary protective resource. Support from healthcare providers particularly midwives and psychologists was similarly valued, though informants noted variability in the quality and accessibility of such support. The dominance of psychological factors ($r = 0.95$) and social support ($r = 0.85$) in the correlation analysis aligns with the second-trimester peak observed in Table 3, as this period coincides with heightened anomaly screening procedures, increased social visibility of pregnancy, and intensified emotional lability. This finding is consistent with Lebel et al., who demonstrated that adequate social support functions as a robust protective factor against maternal mental health difficulties [21]. The integration of quantitative trimester data with qualitative biopsychosocial dimensions demonstrates how methodologically distinct findings can mutually reinforce one another, strengthening the overall validity of the conclusions.

Biological factors including anemia, hemorrhoids, intrauterine growth restriction, and other pregnancy complications constituted a significant anxiety amplifier. Informants directly linked their physical symptoms to worry about fetal safety, creating a cycle where physical distress generated cognitive worry, which in turn exacerbated somatic symptoms. Socioeconomic factors, while present, were less dominant than anticipated; although some informants reported financial constraints and unplanned pregnancy status as stressors, most felt their economic situations were adequate. Environmental factors including social stigma and negative assumptions from neighbors emerged as under recognized contributors. Informants recounted experiences of being judged for appearing “not pregnant enough” or “too worried,” which diminished their sense of social belonging and increased isolation. Finally,

maternal expectations regarding service quality particularly desires for longer counseling sessions, friendlier provider attitudes, and more comprehensive education reflected the gap between available services and perceived needs [28].

The integration of quantitative and qualitative findings reveals a coherent picture of perinatal anxiety among primigravida women in Indonesian primary care settings. The quantitative data established that anxiety affects a substantial minority (39.2%) of this population, with the Chi-Square test revealing a statistically significant association between gestational trimester and anxiety level ($p = 0.041$). As shown in Table 3, the second trimester exhibited the highest anxiety proportion at 56.0%, followed by the first trimester (32.8%) and the third trimester (31.6%). The qualitative data explained why and how anxiety manifests by identifying five biopsychosocial dimensions and their relative contributions. Specifically, the elevated second-trimester anxiety observed quantitatively is qualitatively explained by the convergence of increased pregnancy visibility, heightened social scrutiny, anomaly screening procedures, and intensified hormonal fluctuations, all of which amplify psychological distress during this period. The convergence between methods is particularly strong regarding the primacy of psychological and social support factors, which emerged as the dominant determinants in both statistical and experiential terms [18], [29]. The mixed-methods design enabled a level of interpretation that neither approach could achieve independently: quantitative results identified where and how much anxiety occurs, while qualitative findings revealed the experiential mechanisms underlying these patterns. This complementarity strengthens the validity of the overall findings and demonstrates the value of methodological integration in perinatal mental health research.

The biopsychosocial model proved to be an effective analytical framework, providing organizational coherence to the diverse factors identified. This finding supports Engel's original vision of the model as a clinically useful tool for understanding complex health conditions [8], and extends its application to perinatal mental health in primary care contexts. The identification of the second trimester as the peak anxiety period represents a novel finding with practical implications for antenatal care scheduling, suggesting that enhanced psychological monitoring during this period may be particularly beneficial for primigravida women.

Practical Implications

The findings of this study carry several implications for maternal health practice and policy. For midwives and antenatal care providers, the results support the integration of routine perinatal anxiety screening using validated instruments such as PASS into standard ANC visits. Given that 39.2% of primigravida women experienced anxiety, universal screening rather than risk-based assessment appears warranted. The identification of the second

trimester as a high risk period suggests that vigilance should be heightened during routine visits in this window [18]. For health system planners, the findings highlight the need to expand psychological counseling services within primary care settings. Current counseling sessions lasting 10-15 minutes were perceived as insufficient by informants, suggesting that dedicated mental health consultation time or referral pathways to psychological services should be strengthened. The protective role of social support indicates that family-inclusive interventions and support group programs could serve as effective low cost complements to individual counseling. For future research, the study provides a validated framework for investigating perinatal anxiety through mixed methods approaches, with specific hypotheses that could be tested through longitudinal designs and multivariate analyses[30].

Conclusion

This study provides a comprehensive, mixed-methods understanding of perinatal anxiety among primigravida women in Indonesian primary health care settings, with several key insights that advance both theory and practice. First, the biopsychosocial model demonstrates strong applicability as an integrative framework for perinatal mental health in resource-limited settings, offering a theoretically coherent and clinically actionable lens through which to organize multidimensional anxiety determinants. Second, the identification of the second trimester as a peak anxiety period challenges conventional clinical assumptions and carries direct implications for antenatal care scheduling and targeted psychological monitoring. Third, the convergence of quantitative and qualitative evidence highlights psychological distress and social support deficits as the most prominent modifiable factors, suggesting that counseling-based and family-inclusive interventions may yield the greatest impact. Fourth, the mixed-methods approach itself proved valuable in connecting statistical patterns with lived experiences, enabling a more nuanced interpretation of anxiety determinants than either method alone could provide. These findings support the development of holistic maternal mental health interventions and underscore the importance of routine perinatal anxiety screening, strengthened psychological counseling services, and structured social support programs within antenatal care. Given the cross-sectional design of the quantitative phase, causal inferences cannot be drawn; the associations identified should be interpreted as correlational patterns requiring longitudinal validation. Future research should employ prospective designs to track anxiety trajectories across pregnancy and the postpartum period, and should test the effectiveness of biopsychosocially grounded interventions in reducing perinatal anxiety within primary care contexts.

Limitation and Suggestions

Several limitations of this study should be acknowledged. First, the cross-sectional nature of the quantitative phase precludes causal inference; the association between trimester and anxiety does not establish temporal precedence or causality. Second, the absence of multivariate analysis means that the relative contributions of individual biopsychosocial dimensions could not be statistically compared, limiting the ability to identify the strongest independent predictors. Third, the qualitative sample of 15 informants, while adequate for theme saturation, may not fully capture the diversity of experiences among primigravida women across different sociocultural contexts. Fourth, the study did not incorporate perspectives from spouses, family members, or healthcare providers, potentially limiting the comprehensiveness of the biopsychosocial analysis. Fifth, the data were collected at two health centers within a single province, potentially limiting generalizability to other geographic and socioeconomic settings. Finally, data collection occurred during a transitional health period, which may have introduced contextual factors not present during non-crisis periods. Future research should employ longitudinal designs to track anxiety trajectories from early pregnancy through the postpartum period, utilize multivariate regression analysis to determine independent risk and protective factors, incorporate multi informant perspectives including partners and healthcare providers, replicate the study across diverse geographic and sociocultural settings, and develop and test evidence-based interventions grounded in the biopsychosocial framework identified in this study.

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Conflict of Interest

The author declares no conflict of interest.

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Authors



Dea Pebrianti is a midwife and a graduate of the Master of Midwifery Science program at Universitas 'Aisyiyah Yogyakarta, Indonesia. She is currently a lecturer at the Bachelor of Midwifery and Midwifery Professional Education Program, Universitas Medika Suherman. Her research interests include maternal mental health, perinatal anxiety, and the application of biopsychosocial models in midwifery care. She holds a Bachelor of Midwifery degree (S.Tr.Keb.) and has clinical experience in community-based maternal health services. This manuscript was developed from her master's thesis research. (email: deapebrianti19@gmail.com).



Dyah Ayu Utari is a senior lecturer and researcher in the Midwifery Program at Universitas Muhammadiyah Kudus, Indonesia. She holds a Master's degree in Health Sciences (M.Kes.) and has extensive experience in clinical midwifery and maternal health education, with a focus on holistic care across the female life cycle. She is actively involved in supervising academic research and contributing to the development of health sciences through various publications.(email: dyahayuutari@umkudus.ac.id).



Ismarwati is a lecturer at the Midwifery Department, Faculty of Health Sciences, Universitas 'Aisyiyah Yogyakarta, Indonesia. She earned her Bachelor of Applied Midwifery (S.ST.) and Bachelor of Public Health (S.KM.) before completing her Master of Public Health (M.PH.). Her professional expertise spans reproductive health, community-based midwifery practice, and health promotion strategies. She dedicates her academic career to mentoring students in research methodology and advancing evidence-based midwifery education to improve maternal and child health outcomes (email: ismarwati@unisayogya.ac.id).



Cesa Septiana Pratiwi is a Midwifery Lecturer at Universitas 'Aisyiyah Yogyakarta, Indonesia. She earned her Master of Midwifery (M.Mid.) and Doctor of Philosophy (Ph.D.) with specialization in maternal mental health, particularly antenatal anxiety and depression. Her research explores psychosocial risk factors and intervention strategies to promote psychological well-being during pregnancy. She is dedicated to advancing evidence-based mental health screening tools and developing midwifery-led psychosocial support programs within antenatal care services to improve maternal and neonatal outcomes (email: cesaseptianapratiwi@unisayogya.ac.id).