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An Analysis of Pregnancy-Related Anxiety Using a Biopsychosocial Approach

A Mix Method Study in 13 Districts in South Kalimantan, Indonesia

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ABSTRACT

Psychological disorder in women is one of the most common health problems in women worldwide. When not addressed properly, anxiety can affect maternal and neonatal health. In the biopsychosocial model, mental health is influenced by biological, psychological, and social factors, so a comprehensive approach to mental health services for women during pregnancy is needed. This study aims to analyze anxiety in pregnant women using the biopsychosocial model approach. This study used a mixed-methods research design using a qualitative cross-sectional approach using the Perinatal Anxiety Screening Scale (PASS) instrument and a generic exploratory approach. In this qualitative research stage, in-depth interviews were conducted to explore biological, psychological, and social factors. The collected data was subjected to analysis using the Braun & Clarke approach. Responses were obtained from 385 pregnant women. 62.1% women had anxiety in pregnancy and reporting feeling anxiety caused by body changes, psychological changes and social adaptation during their pregnancy. In multivariate logistic regression, the incidence of anxiety during pregnancy was strongly associated with age (OR = 2.53; 95% CI = 1.57 – 4.09), parity (OR = 2.51; 95% CI = 1.61 – 3.92), and employment status (OR = 1.74; 95% CI = 1.09 – 2.77). The existence of physical, emotional, and social changes during pregnancy has an impact on the emergence of anxiety during pregnancy. The importance of support during pregnancy from health

professionals, the environment and cross-sectoral collaboration is expected to reduce the incidence of anxiety during pregnancy.

Keywords
Mental Health
Anxiety
Pregnancy
Biopsychosocial

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Introduction

Mental health is an integral component of women's overall health. Women are at a higher risk of experiencing mental health problems compared to men, with depression, anxiety, and eating disorders being among the most common conditions. Anxiety is characterized by persistent worry and excessive concern about specific situations or events [1]. Pregnancy represents a critical period in a woman's life course, during which substantial psychological, physical, and social adaptations take place [2]. Mental health is a key aspect of women's healthcare during the perinatal period, as psychological changes associated with pregnancy may increase the risk of mental health disorders, including symptoms of sadness, depression, and anxiety [3]. Anxiety disorders are particularly prevalent among pregnant women, with numerous studies reporting a high incidence during pregnancy [4]. These disorders are commonly manifested by feelings of worry, fear, and concern related to bodily changes, labor and delivery, infant health, and the demands of child-rearing [5].

There are many literature studies related to anxiety and psychological disorders during and after pregnancy. One in five pregnant and postpartum women experience anxiety [6]. Post-traumatic stress disorder (PTSD) is observed in 8.3% of cases, with anxiety levels being highest in developing countries at 27.6%, as compared to other regions [7]. The risk of anxiety increases in high-risk pregnancies [8]. This is in accordance with subsequent research showing that pregnancy should be well prepared by the bride and groom [9]. In line with other research, 30.5% pregnant women were diagnosed with anxiety. Anxiety in pregnancy include 61 cases of pregnancy adjustment disorder (47.7%), 52 cases of general anxiety disorder (40.6%), and 15 cases specifically related to fears (associated with childbirth) (11.7%) [10].

Risk factors for anxiety during pregnancy vary among individuals. Previous studies have shown that anxiety during pregnancy is associated with pregnancy frequency or parity [11], low educational attainment among pregnant women [12], family economic difficulties [13], and limited maternal knowledge [14]. If anxiety is not addressed promptly, it may progress to more severe physical health problems. Additionally, physical discomfort during pregnancy, work-related stress, concerns about the labor process and infant health, as well as

hormonal fluctuations, have been identified as contributing factors to psychological disorders in pregnant women [15]. Psychological problems during pregnancy can affect both the mother and the fetus [16], leading to adverse outcomes such as an increased risk of spontaneous abortion, pre-eclampsia, preterm labor, low birth weight, and developmental disorders, including impairments in cognitive ability, memory, social-emotional functioning, and neurological development [17].

Previous studies conducted in South Kalimantan have indicated that mental health screening, particularly for anxiety during pregnancy, is not routinely performed. Instead, mental health screening is primarily implemented among prospective couples prior to marriage, using the Self-Reporting Questionnaire-20 (SRQ-20) as the screening instrument. Moreover, screening during pregnancy is generally conducted only when noticeable or disturbing symptoms emerge. However, this instrument was not specifically designed to assess anxiety. Early screening for anxiety during pregnancy is therefore essential, as it enables healthcare professionals to provide timely and comprehensive care [18]. The Perinatal Anxiety Screening Scale (PASS) is a standardized instrument for assessing anxiety during pregnancy, as it allows for the specific identification of anxiety during the perinatal period, as reported by Koukopoulos (2021) [18], [19].

Psychological changes during pregnancy that affect anxiety are often caused by biological, psychological, and social aspects. The biopsychosocial model is a model of mental health that describes the biological, psychological, and social aspects that influence mental health [20], [21]. For instance, to provide medical professionals to effectively satisfy the requirements of pregnant women, early detection of anxiety during pregnancy must be performed [22]. This study uses a biopsychosocial model to investigate the incidence of anxiety during pregnancy.

Material and Methods

This study employed a mixed-methods approach using a sequential explanatory design, in which quantitative data collection and analysis were conducted first, followed by a qualitative phase to further explain the quantitative findings. The quantitative component utilized a cross-sectional design to assess the incidence of anxiety among pregnant women during the study period. Subsequently, the qualitative component adopted a generic explanatory qualitative approach, allowing for in-depth exploration of factors underlying anxiety experiences during pregnancy.

The study population consisted of pregnant women who visited community health centers across 13 districts in South Kalimantan Province. For the quantitative phase, the

sample size was calculated using the Lemeshow formula for an unknown population [23]. A total of 385 pregnant women were recruited using a simple random sampling technique, with approximately 30 participants from each district. For the qualitative phase, participants were selected using homogeneous purposive sampling. In-depth interviews were conducted using a structured interview guide, and data collection continued until data saturation was achieved. In total, 13 pregnant women, each representing a different district, were interviewed to explore biological, psychological, and social factors influencing anxiety during pregnancy.

Quantitative data were collected using the Perinatal Anxiety Screening Scale (PASS), which consists of 31 items. According to Diki Yuliani et al. (2024), the Indonesian version of the PASS demonstrated strong internal consistency (Cronbach's alpha = 0.957) and adequate test–retest reliability (correlation coefficient = 0.729), indicating that the instrument is both valid and reliable for assessing anxiety among pregnant women [15]. In addition, a questionnaire capturing anxiety risk factors, including age, parity, education, occupation, and income, was administered. All quantitative instruments were distributed electronically via Google Forms.

Qualitative data were collected using an interview guide that had undergone expert validation and pilot testing. The guide included open-ended questions addressing biological, psychological, and social dimensions related to anxiety during pregnancy [24]. To minimize potential selection bias, careful consideration was given to participant accessibility and engagement. The rigor of qualitative data was ensured through established trustworthiness criteria, including credibility, transferability, dependability, and confirmability.

Quantitative data analysis began with univariate analysis to describe the characteristics of each variable, including independent variables (age, parity, education, occupation, and income) and the dependent variable (incidence of anxiety among pregnant women). Results were presented using frequency distributions in tables, figures, or graphs. Bivariate analysis was then conducted to examine relationships between independent variables and anxiety incidence using Spearman's rank correlation test, appropriate for ordinal data. A two-tailed p-value of less than 0.05 was considered statistically significant. Furthermore, multivariate analysis was performed using multiple logistic regression to identify the most dominant predictors of anxiety, as the dependent variable was categorized as ordinal.

Qualitative data analysis followed the thematic analysis framework developed by Braun and Clarke [25]. This process involved several stages: verbatim transcription of interviews, data familiarization, initial code generation, identification of subthemes, theme development, and refinement of a final thematic framework. The analysis culminated in the

development of a conceptual model based on the interpretation of themes and subthemes. Finally, findings from the quantitative and qualitative phases were integrated and compared, linking participants' narrative responses with quantitative results to provide a comprehensive and explanatory understanding of anxiety among pregnant women.

Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas 'Aisyiyah Yogyakarta (Approval No. 2019/KEP-UNISA/II/2025). The researchers prepared informed consent forms and research information sheets to enable potential participants to make an informed decision regarding their participation in the study.

Results

This study involved 385 pregnant women across 13 districts in South Kalimantan and engaged midwives and other healthcare professionals at community health centers as research partners. These partners collaborated throughout the research process by providing data support, facilities, professional expertise, and assistance in implementing study findings. Their strategic role was essential in facilitating access to research participants, supporting the data collection process, and ensuring the smooth implementation of the study within the community health settings.

Table 1. Sociodemographic Characteristic of the Respondents

Variables	Total (n=385)	Frequency (%)
Age		
20-30	240	62.3
<20 and >35	145	37.7
Parity		
2-3	145	37.7
1 and >3	240	62.3
Education		
Higher Education	233	60.5
Primary Education	152	39.5
Income		
≥ Minimum Regional Wage	58	15.1
< Minimum Regional Wage	327	84.9
Employment		
Unemployed	238	61.8
Employed	147	38.2

Table 2. Prevalence of Anxiety among Respondents

	Total (n=385)	Frequency (%)
No anxiety	146	37.9
Anxiety	239	62.1

As depicted in Table 1, majority of participants were aged between 20-30 years accounting for 62.3%, most pregnant women in primigravida and multigravida (62.3%). On education, more than half 233 (60.5%) of the women had higher education (university level or higher). Whereas Table 2 showed that the majority 239 (62.1%) of the pregnant women had anxiety during pregnancy.

A. Body Changes During Pregnancy

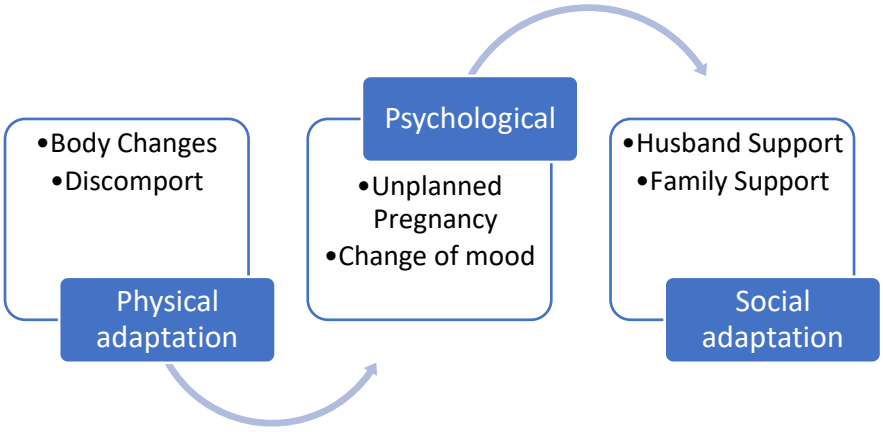


Fig 1. Biopsychosocial Model

Most informants reported experiencing anxiety related to physical changes during pregnancy. These changes varied among participants and included experiences such as weight gain and breast changes, which contributed to feelings of discomfort and concern.

"…… the anxiety is caused more because of the weight gain." (P1)

"…… personally, I experienced continuous weight gain, more acne, and darkening of my skin." (P2)

"…… if I feel anxious because of the bigger breasts" (P3)

B. Psychological Changes During Pregnancy

Research informants indicated that anxiety during pregnancy is also influenced by psychological factors. Commonly reported psychological experiences included unplanned pregnancy, concern when fetal movements were not perceived, and heightened emotional sensitivity and irritability.

"….. at first, it was stressful, but after realizing that the pregnancy was unplanned, I felt better because my husband reassured me." (P1)

"….. when the baby moves, I feel happy, if there is no movement of the baby then I feel worried and sad." (P2)

"….. because my feelings are more sensitive, I often cry, and this sometimes leads to conflicts with my husband" (P3)

C. Social Adaptation During Pregnancy

Most of the study informants said that pregnant women feel anxious and unable to control their emotions due to lack of support from their husbands during pregnancy. while other informants said that the strongest social support came from husbands and parents.

"….. I find it hard to control my emotions, especially when my husband is difficult to ask for help, and I become emotional right away." (P1)

"….. being in an environment where my parents are more supportive and attentive, unlike before, when I felt less noticed, makes me feel well cared for and happy." (P2)

Table 3. Bivariate Analysis between Sociodemographic and Anxiety Level

Variables	Total (n=385)				p-value
	No Anxiety (n=146)		Anxiety (n=239)		
	n	%	n	%	
Age					
20-35	113	29.35	135	35.06	0.001
<20 and >35	33	8.57	104	27.01	
Parity					
2-3	77	20.00	68	17.66	0.001
1 and >3	69	17.92	171	44.42	
Education					
Higher Education	98	25.45	135	35.06	0.038
Primary Education	48	12.47	104	27.01	
Income					
≥ Minimum regional wage	34	8.83	24	6.23	0.001
< Minimum regional wage	112	29.09	215	55.84	
Employment					
Unemployed	105	27.27	133	34.55	0.001
Employed	41	10.65	106	27.53	

Bivariate analysis using Spearman's rank correlation indicated that pregnancy-related anxiety was significantly influenced by several sociodemographic factors. A strong and statistically significant association was observed between maternal age and anxiety during pregnancy (p = 0.001). Pregnant women aged younger than 20 years or older than 35 years experience higher levels of anxiety (27.0%) compared with those in the optimal

reproductive age range. This finding suggests that extreme maternal age, whether too young or advanced, increases vulnerability to pregnancy-related anxiety.

Parity was also significantly associated with anxiety (p = 0.001). Women with a parity of one or greater than three demonstrated a substantially higher prevalence of anxiety (44.4%) compared with women with parity of two to three (17.7%). This indicates that both primiparous and grand multiparous women are at greater risk of anxiety than those with moderate parity. Educational attainment emerged as another significant factor (p = 0.038). Women with higher education levels exhibited a greater prevalence of anxiety (35.1%) than those with only primary education (27.0%). This pattern may reflect increased awareness of pregnancy-related risks or heightened psychosocial expectations among more educated women.

Household income showed a particularly strong association with anxiety (p = 0.001). Pregnant women with incomes below the regional minimum wage experienced markedly higher anxiety levels (55.8%) compared with those earning at or above the minimum wage (6.2%). This finding underscores economic insecurity as a major determinant of anxiety during pregnancy. Employment status also influenced anxiety levels, with unemployed women reporting higher anxiety (34.6%) than their employed counterparts (27.5%). Employment may offer financial stability, structured routines, and social support, all of which contribute to improved psychological well-being.

Table 4. Logistic Regression Analysis of Anxiety and Sociodemographic status

Variables	Odd Ratio	95% CI	p-values
Age			
20-30 years	Ref.	Ref.	
<20 and >35 years	2.53	1.57-4.09	<0.001
Parity			
2-3	Ref.	Ref.	
>3	2.51	1.61-3.92	<0.001
Income			
≥ Minimum regional wage	Ref.	Ref.	
< Minimum regional wage	2.38	1.32-4.51	0.004
Employment			
Employed	Ref.	Ref.	
Unemployed	1.74	1.09-2.77	0.020

Logistic regression was performed to investigate the associations between experienced anxiety and demographic factors such as age, parity, income, education, and occupation status (Table 4). In this study, Pregnant women with age <20 and >35 during pregnancy strongly

increased the risk of anxiety disorders (OR= 2.531, CI=1.57-4,09, p<0.001) compared to those with no complications, after controlling for other variables such as parity and occupation.

Discussion

We investigated the prevalence anxiety in pregnancy in south Kalimantan. Our study found that pregnant women reported feeling more anxious about their physical, mental, and social adaptations. The optimal results from preventive screening during pregnancy will be obtained in the initial phases of pregnancy. Early pregnancy anxiety screening can identify anxiety risk, anxiety levels, and early anxiety management throughout pregnancy. It can also detect early anxiety during pregnancy [26]. In order to promote a "positive pregnancy experience", the WHO stated that services be strengthened and that pregnant women have at least eight prenatal visits.

This research showed that the prevalence of anxiety in pregnancy ranged from 62.03%, which indicates a higher result (30.5%) than studies conducted on pregnant women in Iran [10]. This is in contrast to a study in Uganda showing an incidence of anxiety of 13% [27]. The previous study revealed that the incidence of anxiety among women in the first trimester of pregnancy was 18.2%, which increased to 19.1% in the second trimester, and increase to 24.6% in the last trimester. Denis et al. (2017) mentioned that elevated feelings of anxiety occur in low-to-middle income countries [28].

We also found that anxiety in pregnancy were significantly associated by various aspects, including biopsychosocial aspects, age, education, occupation, economic status, and gravida status. The main finding revealed that the changes in the body, emotions, and environment in pregnancy affects prevalence of anxiety. The physical changes that may occur include weight gain, breast enlargement, pain in various parts of the body, and a sense of nausea. The emotional changes that may occur include irritability, crying, sadness, and sensitivity. These feelings may occur suddenly. The environmental changes that they may experience are such as comments others, and lack of family support. These changes can cause anxiety in pregnant women, manifesting as fear, anxiety, and worry, often accompanied by shortness of breath and crying. Some subjects experience the moderate anxiety level which they can overcome. They have their own way to overcome their anxiety. This also in line with the research conducted by Sulistiyanti and Farida (2020), which reported that 63.3% of pregnant women experience mild anxiety prior to undergoing hypnobirthing [29]. According to Park (2024), 34% of anxious women reported family concerns and relationship problems as primary problems in pregnancy [30].

Anxiety experienced by pregnant women in this study is based on age indicators, that evidence indicates are most common in the 20–35 age group; at the ideal age (20-35 years) there is subjective maturity that affects the health status of the mother. Affective and cognitive maturity work effectively in conjunction to develop coping mechanisms or adjustments to deal with stress [31]. According to ideal circumstances, women between the ages of 20 and 35 are able to deal with stressors with confidence because they're equipped with the natural capacity to successfully deal with anxious feelings. The conflict between two aspects of one's personality might be a stressor at age 35. The mother's expectations differ greatly from the situation that represents her actual health, becoming harmful [32]. Pregnant women's anxiety is readily triggered by an imbalance between reality and their overwhelming sense of expectancies. Pregnant women under the age of twenty experience anxiety and fear due to their unprepared physical condition. According to the study's outcomes, the majority of respondents are between the ages of 20 and 35. This is a result of their inability to adapt to their new roles as mothers.

According to the results of the current study, the average level of anxiety during pregnancy was significantly higher in primiparous women than in multiparous women. Pregnant women with primiparous parity have limitation in experience in the process of pregnancy and childbirth, face excessive fear (anxiety) in childbirth. This new experience gives her mixed emotions of joy and hope as well as fears regarding the experiences that would go through during her pregnancy and childbirth. Similarly, pregnant women with parity who give birth more frequently (> 3) have the risk of harming both themselves and their unborn children due to potential damage to the uterine wall's blood vessels, which affects the fetus's ability to receive nutrition. Reduced food intake may delay the fetus's growth and development, increasing the probability that the baby will be delivered with low birth weight (LBW), leading to anxiety in a large number of mothers. Meanwhile, mothers with parity 2-3 are the safest parity in terms of maternal mortality. They already have experience from previous pregnancies and childbirth. Other study shows that professional support by the midwife and other maternity staff can enhance a woman's sense of self-efficacy and help her become more adapted to the situation and avoid triggering negative emotions [33]. Primiparous women may experience higher psychological vulnerability due to the novelty of pregnancy and childbirth, increased anxiety about the unknown, and limited coping strategies. In contrast, multiparous women may have more established psychosocial resources, yet they may also face different stressors, such as balancing responsibilities from previous children. Biologically, both groups experience similar physiological changes, but prior childbirth experience can influence perception of symptoms and adaptation. Socially, the level of support, cultural expectations, and familial roles can differ significantly between the two groups. These contrasts align well

with the biopsychosocial model, highlighting how physical, emotional, and social dimensions interact in unique ways depending on parity status. Further exploration of these intersections would strengthen the implications of the study.

In this study, education level also directly contributed anxiety in pregnancy. The education of a person can be related to the knowledge of that person. The higher the education of a pregnant woman, the easier it is to receive information and new things [34]. The relationship between the education of pregnant women and the level of anxiety during pregnancy happens because the level of education can affect a person's thinking and actions. People with higher education think more rationally, so they can easily solve problems and develop positive coping mechanisms. Although mothers with high education and low education both experience anxiety during pregnancy, mothers with high education can solve problems, which reduces the intensity of their anxiety. In contrast, mothers with low education have difficulty accessing information, leading to a tendency toward negative views due to their less rational thinking. Then, it contributes to the development of moderate anxiety.

Social and economic factors, such as family income and occupation, determine anxiety levels providing support for women through pregnancy, which is an essential life experience [35]. Pregnant women with low economic status receive greater stresses to maintain their pregnancy until the delivery. This has an impact on the child's development and growth. Parents' anxiety levels reduce with increasing income and raise with decreases income. Primary, secondary, and tertiary requirements are influenced by their financial standing. Children's growth and development are indirectly affected by financial condition. The possibility of living in a healthy environment increases with income, and parental anxiety decreases. On the other hand, anxiety among parents increases with decreasing income rates [36]. According to working mothers, mothers who spend the most of their existence in their homes have higher anxiety levels. Working away from of their home empowers mothers to learn more, which helps them feel unfear. According to one study, a person's stress level is influenced by their occupation. Friends and environments have an important effect on people who participate in outside interests. A number of information and experiences could affect how individuals perceive and cope with anxiety [37].

In line with other research, Pitaloka et al. (2024) found that the prevalence of anxiety in pregnant women was 28%. The factors that influence this phenomenon are numerous and include marital status, economic status, complications, sleep duration, poor sleep quality, and perception. Pitaloka et al. (2024) also found that related personnel, such as health workers, are considered a protective factor against anxiety in pregnant women [38]. Therefore, the quality of health workers is paramount. The interview results indicate that competent health workers

contribute to a more relaxed state in pregnant women. According to Kaydirak et al. (2021) the anxiety level of pregnant women will decrease one week after delivery [39]. According to Dennis et al. (2017), children will suffer as a result of a mother's anxiousness. According to a study, 18.2% of expectant mothers had anxiety during the first trimester of pregnancy, 19.1% during the second trimester, and 24.6% during the third trimester. Denis et al. (2017) mentioned that Anxiety in pregnancy is high in low- to middle-income countries [28].

This study had two main strengths. First, we simultaneously used mix method research to assest anxiety in pregnancy. Second, we used the 13 districts in South Kalimantan for this study. Findings may therefore not be generalizable to pregnant women external to our study. However, this study has certain limitation. Other relevant factors, such as pre-existing mental health conditions and family support, were not considered, which could have led to confounding bias. To establish stronger evidence, further studies with more representative samples from different areas and clinics must be conducted.

Conclusion

This study found that Anxiety during pregnancy raises the chance of complications during pregnancy and delivery. To avoid anxiety during pregnancy, it is important for mothers to be understanding physical, emotional, and social challenges. Furthermore, age, parity, education, occupation, and income provide significant results that affect anxiety during pregnancy. The existence of physical, emotional, and social changes during pregnancy has an impact on the emergence of anxiety during pregnancy. The importance of support during pregnancy from health professionals, the environment and cross-sectoral collaboration is expected to reduce the incidence of anxiety during pregnancy. This study highlights the importance of strengthening maternal health services to identify and conduct early health checks on mothers with vulnerable conditions and high-risk mothers during pregnancy through the integration of mental health screening services for pregnant women at community health center as an effort to early detection and screening so that midwife can identify health problems and minimize health risks.

Limitation and Suggestions

This study has several limitations. First, the transferability of the findings may be limited due to the specific study location; however, the insights generated may still inform future inquiries and challenge existing assumptions in other contexts. Second, the researchers were unable to accurately determine the response rate for this survey. Participation required

respondents to be educated and have internet access, which may have excluded women from lower socioeconomic backgrounds or with lower levels of education.

In addition, the use of self-report instruments such as the PASS presents inherent limitations, including the potential for response bias and subjectivity in self-perception. Furthermore, the absence of longitudinal follow-up restricts the ability to examine changes in anxiety levels over time and to establish causal relationships.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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