

Original Article

Association of maternal age, parity, and gestational age with the severity of striae gravidarum among pregnant women: A cross-sectional study

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Abstract

Background: Striae gravidarum is a common skin change during pregnancy that may affect body image and psychological comfort. Several maternal and obstetric factors have been associated with its development, but evidence regarding factors related to severity remains limited in local primary antenatal care settings.

Objective: This study aimed to analyze the association of maternal age, parity, and gestational age with the severity of striae gravidarum among pregnant women.

Methods: This analytic observational study used a cross-sectional design and was conducted at Midwife Tutik Purwani's Private Practice, a primary antenatal care facility, from August to November 2025. The study population consisted of 49 pregnant women, of whom 35 met the eligibility criteria and were included in the final analysis. Data were collected through direct abdominal observation and documentation of respondent characteristics. The severity of striae gravidarum was categorized as none, mild, moderate, and severe based on the study observation sheet, and associations were analyzed using Fisher's exact test with a significance level of $p < 0.05$.

Results: Maternal age was significantly associated with the severity of striae gravidarum ($p = 0.024$), as were parity ($p = 0.020$) and gestational age ($p < 0.001$). Mild striae gravidarum was more frequently observed among women aged 20–35 years, primigravida women, and those in the second trimester, whereas moderate to severe categories were more common among women aged >35 years, multigravida women, and those in the third trimester.

Conclusion: Maternal age, parity, and gestational age were significantly associated with the severity of striae gravidarum in this sample. These findings support the importance of early identification and counseling for pregnant women with maternal and obstetric characteristics associated with more severe striae gravidarum.

Background

Striae gravidarum is a common dermatologic change during pregnancy, characterized by atrophic linear streaks on the abdomen, breasts, thighs, and gluteal region. These lesions initially appear as erythematous or violaceous striae rubrae and gradually progress to pale, silvery striae albae. Although benign, striae gravidarum may persist and cause cosmetic concerns as well as and psychological distress in pregnant women (Jayanti et al., 2025; Sanjana & Rajendra, 2021). Previous studies have reported that the prevalence of striae gravidarum is high, ranging from 50% to 90% among pregnant women, making it one of the most frequently observed pregnancy related skin conditions in clinical practice (Mammadov et al., 2024).

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practice. Several factors have been associated with striae gravidarum, including younger maternal age, family history, gestational weight gain, body mass index, and neonatal birth weight (Mammadov et al., 2024). In Indonesia, a study at (Jayanti et al., 2025) at RSUD Dr. H. Abdul Moeloek reported a significant association between parity and striae gravidarum ($p < 0.001$), while another study found a significant relationship between gestational age and striae gravidarum, with the highest incidence observed in the second and third trimesters (Variha, Aryunisar, et al., 2024). Other studies have also confirmed the association of striae gravidarum with maternal age, increased body mass index, gestational weight gain, and family history (Jayanti et al., 2025; Mammadov et al., 2024).

From a theoretical perspective, younger maternal age is thought to be associated with skin elasticity and tissue response to stretching, whereas parity reflects repeated abdominal stretching across previous pregnancies. Gestational age also plays an important role because, as pregnancy

progresses, uterine size and abdominal circumference increase, resulting in greater mechanical pressure on the skin (Farahnik et al., 2017). Recent studies have shown significant associations between parity and striae gravidarum, as well as between gestational age and striae gravidarum, while international evidence has also identified younger maternal age as a contributing factor (Atwal et al., 2006).

However, most existing studies have examined these risk factors separately. Only a limited number of studies have analyzed maternal age, parity, and gestational age simultaneously in a single model among pregnant women in a specific health care setting. The novelty of the present study lies in the simultaneous analysis of maternal age, parity, and gestational age in relation to striae gravidarum, thereby providing a more comprehensive understanding of the most relevant factors in the local population and supporting preventive education for health care providers. This study aimed to analyze the association of maternal age, parity, gestational age with the severity of striae gravidarum among pregnant women.

Methods

Study Design

This study employed an analytic observational design with a cross-sectional approach. The cross-sectional design was chosen because the objective was to assess the association between maternal age, parity, gestational age, and the occurrence of striae gravidarum at a single point in time during routine antenatal care. This design is appropriate for identifying associations, but it does not establish temporal sequence or causal relationships.

Study setting

This study was conducted at Midwife Tutik Purwani's Private Practice, a primary antenatal care facility that provides routine prenatal care to pregnant women in the surrounding community. Data collection took place during routine antenatal visits from August through November 2025. Abdominal examinations were conducted in a private room to ensure the respondents' privacy. These examinations were performed by the researcher and by the midwife.

Study population and sampling

The study population comprised all pregnant women who attended Midwife Tutik Purwani's Private Practice during the study period. A total of 49 pregnant women constituted the initial population frame. Eligible participants were selected using purposive sampling based on predetermined inclusion and exclusion criteria. Of these, 35 women were included in the final analysis, whereas 14 were excluded because they did not meet the eligibility criteria, refused to participate, or had incomplete data. The inclusion criteria were pregnant women in the second and third trimesters who were willing to participate, able to communicate effectively, and provided informed consent for abdominal observation. The exclusion criteria were pregnant women with other abdominal skin conditions that could interfere with the assessment of striae gravidarum. Women who did not meet the criteria or did not provide consent were not included.

Variables

The variables examined in this study were maternal age, parity, gestational age, and the severity of striae gravidarum. Maternal age was categorized as <20 years, 20–35 years, and >35 years. Parity was classified as primigravida and multigravida. Gestational age was grouped into second and third trimesters. The primary outcome of this study was the severity of striae gravidarum.

Severity of striae gravidarum was assessed using the Davey Score, based on direct observation of the abdominal skin. The number of striae was scored as 0 if no striae were present, 1 if fewer than 5 striae lines were observed, 2 if 5–10 striae lines were observed, and 3 if more than 10 striae lines were observed. The color of striae was scored as 0 for white, 1 for light brown, 2 for dark brown, and 3 for dark brown to blackish. The combined score was then categorized into four groups: 0–3 indicating no significant striae, 4–9 mild, 10–12 moderate, and >16 severe.

Data Collection

Data were collected through direct observation and documentation of respondent characteristics during routine antenatal visits. Each participant underwent abdominal examination using the study observation sheet, and the findings were recorded immediately after assessment. . Maternal

age, parity, gestational age, and striae gravidarum severity scores were documented for analysis.

Data analysis

Data were analyzed descriptively using frequency distributions and percentages. The associations between maternal age, parity, gestational age, and the severity categories of striae gravidarum were analyzed using Fisher's exact test because several contingency table cells had expected counts of less than 5. A p-value of <0.05 was considered statistically significant. Because of the relatively small sample size and sparse data in several categories, the analysis was limited to bivariate associations and the findings were interpreted cautiously.

Ethical Considerations

The study was conducted in accordance with ethics principles, including written informed consent, confidentiality of participant identity, and the use of data solely for research purposes. All respondents participated voluntarily and underwent abdominal observation only after providing consent.

Results

Table 1 shows that most respondents were aged 20–35 years (74.2%), with nearly equal proportions of primigravida and multigravida women (48.6% each). More than half were in the third trimester (54.3%). Mild striae gravidarum was the most common finding (45.7%), followed by moderate (40.0%), severe (8.57%), and no striae gravidarum (5.73%).

Table 1. Distribution of Respondents by Maternal Age, Parity, and Gestational Age

Variables	Frequency (n)	Percentage (%)
Age		
< 20 years	0	0
20-35 years	26	74.2
>35 years	9	25.8
Parity		
Primigravida	17	48.6
Multigravida	18	51.4
Gestational age		
Second trimester	16	45.7
Third trimester	19	54.3
Severity of striae gravidarum		
None	2	5.73
Mild	16	45.7
Moderate	14	40.0
Severe	3	8.57

Based on Table 2, Fisher's exact test showed significant associations between maternal age, parity, gestational age, and the severity of striae gravidarum. Mild striae were more common among women aged 20–35 years and primigravida women, whereas moderate and severe categories were more frequently observed among women aged >35 years, multigravida women, and those in the third trimester. However, because the sample size was small and several cells contained very low counts, these findings should be interpreted cautiously. The present analysis indicates differences in the distribution of striae gravidarum severity across maternal age, parity, and gestational age categories, but it does not support a strong conclusion that severity

increases progressively with these factors without an ordinal or trend analysis.

Discussion

The findings of this study demonstrate that maternal age was significantly associated with the occurrence of striae gravidarum ($p = 0.024$), indicating that maternal age is one of the important maternal factors related to the development of striae during pregnancy. This result is consistent with previous evidence suggesting that maternal age influences the occurrence of striae gravidarum (Ud-Din et al., 2016). Younger maternal age has been widely recognized as a common risk factor, and Liu et al. reported a higher incidence of striae gravidarum among younger mothers, with a prevalence of

58.9% in their sample. From a physiological perspective, striae gravidarum develop when skin stretching exceeds the elasticity of the dermis, accompanied by alterations in collagen and elastin. Maternal reproductive age is therefore linked to connective tissue status, hormonal adaptation, and skin regeneration capacity, while pregnancy-related hormonal changes and

abdominal distension may accelerate damage to dermal elastic fibers (Liu et al., 2018). In addition, older maternal age has also been identified as a significant predictor of striae gravidarum, possibly because reduced skin elasticity and collagen production may increase susceptibility to stretch marks during pregnancy (Xiong et al., 2024).

Table 2. Association Between Maternal Age, Parity, and Gestational Age with Striae Gravidarum

Variables	Severity of Striae Gravidarum				p-Value
	None	Mild	Moderate	Severe	
Age					
20-35 years	2 (7.7%)	15 (57.7%)	8 (30.8%)	1 (3.8%)	0.024
>35 years	0	1 (11.1%)	6 (66.7%)	2 (22.2%)	
Parity					
Primigravida	2 (11.8%)	10 (58.8%)	2 (11.8%)	3 (17.6%)	0.020
Multigravida	0(0.0%)	5 (29.4%)	12 (70.6%)	0 (0.0%)	
Grande multigravida	0 (0.0%)	1 (100%)	0 (0.0%)	0(0.0%)	
Gestational age					
Second trimester	2 (12.5%)	12 (75%)	2 (12.5%)	0 (0.0%)	<0.001
Third trimester	0 (0.0%)	4 (21.1%)	12 (63.2%)	3 (15.8%)	

Parity also showed a highly significant association with striae gravidarum ($p = 0.02$). Clinically, parity is a highly relevant obstetric factor because it reflects repeated tissue stretching across previous pregnancies. In primigravida women, the body undergoes its first adaptation to pregnancy-related stretching, whereas in multigravida women, the skin may already have experienced structural changes that make it more vulnerable. This interpretation is supported by (Jayanti et al., 2025), who found significant associations between parity and both the occurrence and severity of striae gravidarum, thereby strengthening the evidence that parity is an important determinant of SG. Similarly, (Nusrat et al., 2019) reported that striae gravidarum occurred in 28.6% of primigravida women and 71.4% of multigravida women, suggesting that a greater number of pregnancies is associated with a higher incidence, most likely due to repeated skin stretching in successive pregnancies.

Gestational age was also significantly associated with the occurrence of striae gravidarum ($p < 0.001$), with cases more frequently observed in the second and third trimesters, particularly in mild and moderate categories. This pattern is consistent with the theory that striae gravidarum typically emerge during the phase of pregnancy when uterine growth and abdominal distension increase substantially, thereby placing greater mechanical stress on the skin (Sari, et al 2025 &

Pricilla et al, 2026).. Striae tend to appear more often in the second and third trimesters because early pregnancy is characterized by relatively limited hormonal change and skin stretching, which lowers the risk of striae formation (Purwani et al, 2025 & Ramayani et al, 2026). As pregnancy progresses, hormonal influences such as estrogen and progesterone may reduce skin elasticity and alter collagen production, further weakening skin structure and increasing susceptibility to striae (Variha et al., 2024). In late pregnancy, the combined effects of fetal growth, uterine enlargement, and maternal weight gain increase abdominal tension, and this mechanical load is further compounded by reduced skin elasticity, making gestational age a strong factor in both the occurrence and severity of striae gravidarum (Alhomieed et al., 2025).

Overall, these findings confirm that maternal age, parity, and gestational age are associated with the occurrence of striae gravidarum. Together, these variables reflect the physiological adaptations of pregnancy that influence skin elasticity, abdominal tissue distension, and the dermal response to stretching. Thus, striae gravidarum should be understood not merely as a cosmetic concern, but as a biological manifestation of skin adaptation during pregnancy.

Conclusion and Recommendation

This study found statistically significant associations between maternal age, parity, and gestational age and the severity of striae gravidarum. The severity distribution differed across maternal and obstetric categories, with more pronounced categories observed among women aged >35 years, multigravida women, and those in the third trimester. Although striae gravidarum is a benign condition, it remains clinically relevant because of its potential impact on comfort, body image, and psychosocial well-being during pregnancy.

These findings support the importance of anticipatory counseling and individualized education during antenatal care, particularly for pregnant women with maternal and obstetric characteristics associated with more severe striae gravidarum. Future studies should include larger and more diverse samples, preferably using multi-center and longitudinal designs, and consider additional variables such as body mass index, gestational weight gain, family history, and nutritional status to further clarify the determinants of striae gravidarum severity.

Midwives and other maternal health-care providers are encouraged to assess skin changes during pregnancy and to provide appropriate education, reassurance, and self-care guidance as part of routine antenatal services.

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Declaration of conflict of interest

The authors declare no competing interests.

Declaration on the Use of AI

No AI tools were used in the preparation of this manuscript.

Data Availability Statement

Data sharing is not applicable to this article.

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