Original Article

Predictors of Pregnant Women's Delayed Initiation of Antenatal Care in Central Thailand

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Abstract

Background: Delayed initiation of antenatal care leads to adverse effects on maternal and fetal health outcomes. This study aimed to identify the predictors of delayed initiation of antenatal care among pregnant women. **Materials and Methods:** This descriptive cross-sectional study used a purposive sample of 330 women attending a hospital's antenatal clinic in Central Thailand, divided into two groups: those attending the first antenatal visit before 12 weeks of gestation and those attending the first antenatal visit 12 weeks or more after. From May to October 2024, data were collected on sociodemographic information, knowledge, beliefs about pregnancy and antenatal care, antenatal care service setting, and social support. Data were analyzed using descriptive and multivariate logistic regression. **Results:** The predictors of delayed initiation of antenatal care were attitude (95% CI: 3.65–17.59; $P < 0.001$; OR = 8.02), social support (95% CI: 3.29–14.91; $P < 0.001$; OR = 7.00), perceived benefit (95% CI: 2.65–17.59; $P < 0.001$; OR = 5.91), unplanned pregnancy (95% CI: 1.72–8.46; $P = 0.001$; OR = 3.81), and perceived risk (95% CI: 1.58–7.08; $P = 0.002$; OR = 3.34). **Conclusions:** Healthcare providers should address these predictors to encourage timely antenatal care before 12 weeks of gestation.

Keywords: *Logistic models, pregnant people, prenatal care*

Introduction

Maternal deaths occur nearly every 2 minutes due to preventable causes associated with pregnancy and childbirth, often stemming from perinatal complications exacerbated by inadequate antenatal care management.[1] This is especially true for pre-existing conditions that deteriorate during pregnancy. Severe bleeding, infections, high blood pressure during pregnancy, obstetric labor complications, and unsafe abortions account for 75% of all maternal deaths.[2] Delayed antenatal care is defined as initiating care after 12 weeks of gestation. The first visit should occur within 12 weeks to optimize pregnancy and neonatal outcomes[3] and mitigate the risk of maternal and fetal death.[4] In Thailand, the percentage of women initiating first-trimester antenatal care declined from 82.9% in 2020 to 75.1% in 2023.[5] The trend of delaying antenatal care increases the risks of premature birth,[6] low birth weight,[7] and maternal complications throughout pregnancy.[8]

Factors associated with delayed initiation of antenatal care include age,[9,10] maternal educational level,[11] parity,[10,11] and unplanned pregnancy,[11,12] women's knowledge and attitudes about pregnancy,[10,11] accessibility of services,[13] distance and travel time to a care facility, socioeconomic status, cultural beliefs, and the quality of care provided.[14] Additionally, inadequate social support from spouses or family members, along with limited involvement in antenatal services, can hinder decision-making.[15] Perceptions of the benefits of early care and the risks of delayed care also predict the timing of antenatal care initiation.[16]

The PRECEDE-PROCEED Model[17] was used to explore the characteristics predicting the delays in initiating antenatal care. Predisposing factors, such as knowledge and beliefs, motivate behavior change; enabling factors facilitate it; reinforcing factors sustain it. By applying the model to behavior modification, healthcare professionals can guide pregnant women toward early antenatal care. Two studies on

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delayed antenatal care initiation have been conducted in the southern[18] and eastern regions[19] of Thailand, but neither has focused on the central region. Because each region has a distinct socioeconomic and cultural context, the evidence on why pregnant women delay initiating antenatal care is incomplete. Therefore, the study aimed to determine the predictors of delayed initiation of antenatal care among pregnant women.

Materials and Methods

This descriptive, cross-sectional observational study was conducted to identify factors associated with delayed initiation of antenatal care among pregnant women; data were collected from May to October 2024. A purposive sample of 330 pregnant women at a hospital's antenatal clinic in Central Thailand volunteered to participate. The sample size was calculated using Yamane's formula,[20] in which $n = N/1 + N (e)^2$, (n = sample size; N = population size of 1200; e = margin of error/95% confidence level = 0.05) or $n = 1200/1+ [1200 (0.05)^2] =300$. An additional 10% was included for possible attrition and missing data. Inclusion criteria for participant eligibility were absence of emergency obstetric problems, no documented psychiatric diagnosis, and willingness to participate. An exclusion criterion was the inability to read Thai. After obtaining written informed consent forms, participants completed five self-report questionnaires developed by the research team based on a thorough literature review. Collected data included sociodemographic characteristics, knowledge, attitudes, health beliefs, antenatal services, and social support. The total scores for each scale were divided into high and low levels, with low scores coded as 0 and high scores as 1. Knowledge was assessed using 10 items with responses of 1 (True) or 0 (False). Total scores range from 0 to 10, with 8 to 10 indicating a high level of knowledge and 0 to 7 indicating a low level.[21] Attitude was measured using a 10-item Likert scale from 1 (Extremely disagree) to 5 (Extremely agree). Half of the items were negatively worded and required reverse-scoring. Total scores range from 10 to 50, with 40 to 50 indicating a positive attitude and 10 to 39 indicating a negative attitude. Health beliefs comprised two dimensions: perceived benefit of early antenatal care (6 items) and perceived risk of delayed antenatal care initiation (6 items). Each item was scored on a Likert scale from 1 (Extremely disagree) to 5 (Extreme agree), with dimension scores totaled individually. Antenatal care services were evaluated using eight items using a 5-point Likert scale. Total scores range from 8 to 40, with 32 to 40 indicating a high level of agreement and 8 to 31 indicating a low level of agreement. Social support was assessed using a 10-item, 5-point Likert scale. Total scores range from 10 to 50, with 40–50 indicating a high level of social support and 10–39 indicating a low level. An obstetrician and two nurses specialized in maternal-child nursing and midwifery validated the content with an average content validity index of 0.96. A pilot test with 30 pregnant women revealed the knowledge scale's internal reliability to be 0.82, as measured by the Kuder Richardson-20. The Cronbach's alpha coefficients for the other four scales were 0.86 for attitude, 0.81 for health beliefs, 0.89 for antenatal care services, and 0.88 for social support. Descriptive statistics were used to analyze the participants' characteristics and variables. Chi-square test was used to analyze the relationships among the variables. Multivariable logistic regression modeling identified predictors of delayed initiation of antenatal care 12 or more weeks after gestation (code as 1). Data were analyzed using IBM® SPSS® software, version 25 (IBM, Inc.). The significance level was $P < 0.05$.

Ethical considerations

The Institutional Research Ethics Committee of Rangsit University, Thailand (COA.No. RSUERB2024-064) approved the study. Written informed consent was obtained from all participants after the research was explained.

Results

In this study, 330 pregnant women participated with a mean (SD) age of 26.60 (6.55) years. Nearly half the women had attained tertiary education or higher. Over half had experienced multiple pregnancies and indicated their pregnancy was planned. The sample was divided into two groups: those who initiated their first antenatal visit before 12 weeks of gestation and those who delayed until 12 weeks or more. Chi-square test results indicated that a greater proportion of pregnant women who initiated first antenatal visit before 12 weeks were aged ≥ 20 years, had a tertiary educational level or above, had an unplanned current pregnancy, and scored higher on the knowledge, attitude, perceived benefit and risk, antenatal care services, and social support scales, and the difference was statistically significant ($P < 0.05$) [Table 1]. Logistic regression results indicated the greatest odds of delaying initiation of antenatal care were associated with low levels of attitude (OR = 8.02; $P < 0.001$), social support (OR = 7.00; $P < 0.001$), perceived benefit (OR = 5.91; $P < 0.001$), unplanned pregnancy (OR = 3.81; $P < 0.001$), and perceived risk (OR = 3.34; $P = 0.002$) [Table 2].

Discussion

The main objective of this study was to identify predictors of delayed initiation of antenatal care. The finding indicated that the best predictor of delayed initiation of antenatal care among pregnant women after 12 weeks of gestation was a low attitude score. Women with a positive obstetric history often believe their pregnancy and the baby's birth will be safe and normal, leading them to perceive little need for early antenatal care.[15] Most of the pregnant women reported no health problems, aligning with a study that found many women schedule antenatal care late, believing there are no benefits to attending appointments in the first

Table 1: Relationships between demographic variables, knowledge, attitude, perceived benefit, perceived risk, antenatal service, social support, and delayed initiation of antenatal care (*n*=330)

Variable	Timing of antenatal care initiation			χ^2	*p*
	GA* ≤12 weeks *n* (%)	GA** >12 weeks *n* (%)	Total *n* (%)		
Age (years)					
<20	20 (6.10)	51 (15.50)	71 (21.50)	17.25	<.001
≥20	145 (43.90)	114 (34.50)	259 (78.50)		
Educational level				10.90	0.001
Secondary or lower	68 (20.60)	98 (29.70)	166 (50.30)		
Tertiary or above	97 (29.40)	67 (20.30)	164 (49.70)		
Parity				4.48	0.034
Primipara	79 (23.90)	60 (18.20)	139 (42.10)		
Multipara	86 (26.10)	105 (31.80)	191 (57.90)		
Unplanned pregnancy					
No	134 (40.60)	66 (20.00)	200 (60.60)	58.69	<.001
Yes	31 (9.40)	99 (30.00)	130 (39.40)		
Knowledge					
High level	135 (40.90)	54 (16.40)	189 (57.30)	81.25	<.001
Low level	30 (9.10)	111 (33.60)	141 (42.70)		
Attitude					
High level	139 (42.10)	48 (14.50)	187 (56.70)	102.19	<.001
Low level	26 (7.90)	117 (35.50)	143 (43.30)		
Perceived benefit					
High level	143 (43.30)	67 (20.30)	210 (63.36)	75.64	<.001
Low level	22 (6.70)	98 (29.70)	120 (36.40)		
Perceived risk				47.69	<.001
High level	128 (38.20)	64 (19.40)	190 (57.60)		
Low level	39 (11.80)	101 (30.60)	140 (42.40)		
Antenatal care service					<.001
High level	112 (33.90)	79 (23.90)	191 (57.90)	13.54	
Low level	53 (16.10)	86 (26.10)	139 (42.10)		
Social support					<.001
High level	131 (39.70)	54 (16.40)	185 (56.10)	72.94	
Low level	34 (10.30)	111 (33.60)	145 (43.90)		

GA; Gestational age. GA* ≤12 weeks of gestation; early antenatal care. GA** >12 weeks of gestation: delayed initiation of antenatal care

trimester.[16] Individuals' positive behavioral intentions are influenced by their beliefs, subjective norms, and attitudes about the perceived favorability of outcomes.[22] For pregnant women, a positive attitude toward pregnancy and antenatal care is likely to predict early prenatal care. Furthermore, socio-cultural values and norms significantly influence individuals, serving as risk factors for delaying antenatal care. Pregnant women with low levels of social support are more likely to delay initiating antenatal care. Mothers or spouses often advise them to delay care until after the first trimester, underscoring their influence on decision-making.[14] Individuals who receive support are more likely to achieve positive health outcomes and cope effectively with stressful situations. Pregnant women with strong family support are more encouraged to schedule their first antenatal care visit earlier.

Our study found that pregnant women with a low perception of the benefits of antenatal care are more likely to delay its initiation. Many women view early initiation of antenatal care primarily to assess the baby's condition, leading them to believe that starting early care is an inefficient use of resources. The pregnant women who later initiate antenatal care do so for curative rather than preventive reasons.[14] Individuals who recognize the benefits of preventive measures are less likely to engage in risky behaviors, especially when they believe these measures are effective.[22] A lack of awareness regarding harmful signs during pregnancy can further contribute to the delays in seeking early antenatal visits.[23] This study indicated that pregnant women under 20 are less likely to seek early antenatal care. Factors contributing to delayed antenatal care included fear of continuing the pregnancy, a

Table 2: Predictors of pregnant women's delayed initiation of antenatal care

Variable	*p*	OR*	95% CI**	
			Lower	Upper
Age (years)				
<20	0.008	3.63	1.41	9.36
≥20	Reference			
Unplanned pregnancy				
No	Reference			
Yes	0.001	3.81	1.72	8.46
Knowledge				
High level	Reference			
Low level	0.007	2.97	1.35	6.50
Attitude				
High level	Reference			
Low level	<0.001	8.02	3.65	17.59
Perceived benefit				
High level	Reference			
Low level	<0.001	5.91	2.65	17.59
Perceived risk				
High level	Reference			
Low level	0.002	3.34	1.58	7.08
Social support				
High level	Reference			
Low level	<0.001	7.00	3.29	14.91

*OR=Odd ratio. **CI=Confidence interval

desire to terminate it, and concerns about parental blame.[24] Feelings of shame and stigma associated with pregnancy may further deter adolescents from accessing screenings and education early in their pregnancies. Adolescents may not only fail to recognize the early signs of pregnancy but also attempt to conceal it due to fear, denial, and the perception that it is irrelevant.[25] Younger primiparous women may lack confidence in navigating maternity services or be unaware of the necessity to initiate early care.[9] Consequently, they experience delays in accessing antenatal care due to limited social support, insufficient knowledge about its importance, cultural beliefs, and economic and transportation barriers.

Women with unplanned pregnancies are more likely to delay seeking antenatal care, leading women to consider abortion or deny their condition. A lack of family support can diminish motivation to seek early care, aligning with findings from previous studies.[15,16] Emotional and financial unpreparedness often accompanies these situations as this unreadiness can generate confusion and uncertainty. Misconceptions about the appropriate timing for initiating antenatal care have been linked to late access to services.[10,12,26-28] Women with inadequate knowledge are less likely to seek antenatal services,[11] while those with adequate understanding are better positioned to recognize its importance. This study has some limitations that should be considered when interpreting the results. First, the present study was cross-sectional, and data were collected from a purposive sample at a single hospital. There may be limitations in applying the results to other hospitals with different contexts. Second, the distribution of variables in the analysis differs, which may limit the generalizability of the results. Therefore, further research is needed.

Conclusion

Attitudes toward pregnancy and antenatal care significantly predict delays in initiating antenatal care after 12 weeks of gestation. Additional factors included lack of social support, low perceived benefits and risks of antenatal services, and unplanned pregnancy. Healthcare providers should advocate for preparation and readiness among pregnant women, including attitudes, social support, perceived benefits of early antenatal care, and the risks of delayed antenatal care, which affect early attendance.

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Conflicts of interest

Nothing to declare.

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