ปัจจัยทำนายการมาฝากครรภ์ครั้งแรกของหญิงตั้งครรภ์ในจังหวัดบินดึน ประเทศเวียดนาม

Factors predicting timely initiation of antenatal care among pregnant women in Binh Dinh Province, Vietnam

บทความวิจัย
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เถือง ติ ลี เหงียน พย.ม.* วรรณี เดียวอิศเรศ Ph.D.** อุษา เชื้อหอม, Ph.D.***
Thuong Thi Le Nguyen MNS,* Wannee Deoisres, Ph.D.** Usa Chuahorm, Ph.D.***

บทคัดย่อ

การวิจัยความสัมพันธ์เชิงทำนายครั้งนี้มีวัตถุประสงค์เพื่อศึกษาระยะเวลาที่มาฝากครรภ์ครั้งแรกและอิทธิพลของอายุ การศึกษา จำนวนครั้งของการคลอด ความรู้เกี่ยวกับการฝากครรภ์ และการสนับสนุนของครอบครัวในการตั้งครรภ์ ต่อการมาฝากครรภ์ครั้งแรกภายในช่วงเวลาที่กำหนด (อายุครรภ์ไม่เกิน 12 สัปดาห์) ของหญิงตั้งครรภ์ชาวเวียดนาม กลุ่มตัวอย่างเป็นหญิงตั้งครรภ์ จำนวน 109 คน ที่มาฝากครรภ์ ณ คลินิกรับฝากครรภ์โรงพยาบาลแห่งหนึ่งในจังหวัดบินดึน ประเทศเวียดนาม เลือกกลุ่มตัวอย่างโดยการสุ่มอย่างง่าย เก็บข้อมูลใช้แบบสอบถาม วิเคราะห์ข้อมูลด้วยสถิติพรรณนา เพียร์สันไคสแควร์ สหสัมพันธ์พอยซ์ไบซีเรียล และการวิเคราะห์การถดถอยพหุโลจิสติก ผลการวิจัยพบว่า หญิงตั้งครรภ์มาฝากครรภ์ครั้งแรกเมื่ออายุครรภ์เฉลี่ย 11.85 สัปดาห์ (*S.D.* = 5.34) ร้อยละ 72.5 มาฝากครรภ์ครั้งแรกภายในช่วงอายุครรภ์ 12 สัปดาห์ หญิงตั้งครรภ์ที่มีอายุในช่วง 18-35 ปี มาฝากครรภ์ครั้งแรกช้ากว่ากำหนดสูงเป็น 47.95 เท่าของหญิงตั้งครรภ์ที่มีอายุมากกว่า 35 ปี (*AOR*= 47.95, 95% CI= 3.80-605.74, p=.003) ความรู้เกี่ยวกับการฝากครรภ์ (*AOR* =.24, 95% CI=.10-.57, p =.001) และการสนับสนุนของครอบครัวในการตั้งครรภ์ (*AOR* =.73, 95% CI=.57-.95, p=.020) เป็นปัจจัยที่มีอิทธิพลต่อการมาฝากครรภ์ครั้งแรกภายในช่วงเวลาที่กำหนด ผลการศึกษาเสนอแนะว่าควรเร่งส่งเสริมให้หญิงตั้งครรภ์ที่มีอายุในช่วง 18-35 ปี มาฝากครรภ์ครั้งแรกภายในช่วงเวลาที่กำหนดมากขึ้น โดยให้ความรู้เกี่ยวกับการฝากครรภ์และส่งเสริมการสนับสนุนของครอบครัว

คำสำคัญ: หญิงตั้งครรภ์ การมาฝากครรภ์ครั้งแรก เวียดนาม

Abstract

The objectives of this predictive correlational study were to determine the timely initiation of antenatal care (ANC) and examine the influence of maternal age, maternal education, parity, knowledge about ANC, and family support for pregnancy on timely initiation of ANC among Vietnamese pregnant women. A random sample of 109 pregnant women visiting Antenatal Clinic from February to March, 2015 at Quy Nhon General Hospital in Binh Dinh Province, Vietnam was recruited in the study. The self-report questionnaires

*Master Degree student, Faculty of Nursing, Burapha University, Thailand and Teacher in Binh Dinh Medical College, Vietnam
**Associate Professor Dr, Faculty of Nursing, Burapha University, Thailand
***Assistant Professor Dr, Faculty of Nursing, Burapha University, Thailand

were used for data collection. The data were analyzed by using descriptive statistics, Pearson Chi-Square, Point Biserial, and multiple logistic regression. The study results showed that the average gestational age for the first ANC of the respondents were 11.85 weeks (*S.D* = 5.34) and more than two thirds of the respondents started ANC within 12 weeks (72.5%). Pregnant women who were ≤ 35 years old were 47.95 times more likely to initiate ANC after 12 weeks compared to women older than 35 years old (*AOR* = 47.95, 95% CI = 3.80-605.74, *p* = .003). Women's knowledge about ANC (*AOR* = .24, 95% CI = .10-.57, *p* = .001) and family support for pregnancy (*AOR* =.73, 95% CI = .57-.95, *p* = .020) were found to be significant predictors of early initiation of ANC. These findings suggest that we should pay more attention to pregnant women who were ≤ 35 years old and increasing knowledge about ANC for them. Antenatal care should not be only focused on pregnant women, needs to encourage the attention of all members in family.

keywords: Pregnant women, initiation of antenatal care, Vietnam

Introduction

Pregnancy is one of the most important periods in the life of a woman, her family and the society. Extraordinary attention is therefore, given to antenatal care by the health care systems in most countries.[1] If a mother dies while giving birth or during pregnancy, it will make her family and community wretched while the children often face higher risks of poverty, neglect, and mortality.[2] The women who initiated their ANC in the first trimester of pregnancy maximize the benefits of screening for complications and monitoring fetal and maternal health. Pregnant women who initiated their ANC later than the first trimester show poorer outcomes such as low birth weight and preterm birth.[3] Therefore, early initiation of ANC is becoming one of the most important components of the ANC. In Vietnam, the Ministry of Health has recommended at least three ANC visits for uncomplicated pregnancies and one in each trimester with the first visit occurring in the first trimester.[4] There are many pregnant women attending ANC late in many countries including Vietnamese women.[5] Many studies around the world have paid attention on initiation of ANC and several studies were conducted in the developing countries[6,7,8,9] and some in the developed countries.[3,10,11] However, in Vietnam, little has been known about the initiation of ANC, especially studies focusing on factors related to timely initiation of ANC. Almost all previous studies in recent years in Vietnam were conducted in the Southern[12,13] and Northern Vietnam.[14] However, in the central of Vietnam there are few studies about ANC. These studies mainly mentioned on factors related to utilization of ANC with the focus on number of ANC.[12,13] A study was conducted in three provinces of Vietnam: one province in the Central and two provinces in the South of Vietnam with the aims to identify factors related to ANC utilization concluded that 29 % of women in these provinces had not attended any ANC, 25 % of them had at least one ANC after 4 months, these women had an average gestational age at first visit of 3.7 months.[12]Another study in the North of Vietnam showed that only 69.1% of women starting ANC in the first trimester. [14] The results from these studies indicated that Vietnamese pregnant women still

started ANC late.

Based on literature review, maternal age and education were associated with starting antenatal visit. A study in Ghana indicated that early starting ANC was most common in women who were between 20-24 years old[15] and women who graduated high school or higher were booking ANC earlier than women who had lower education.[16] The relationships of parity and knowledge of pregnant women about ANC on timely of booking ANC were showed in numerous studies. One study in Nigeria by Nwagha and Anyaehie[17] indicated that primigravidae women initiated booking later than multigravidae. Knowledge of pregnant women about ANC plays an important role in early initiation of ANC. One study indicated that more than one thirds of women believed that the second trimester was the ideal gestational age for booking, and 83.1% of them booked after the first trimester and the mean gestational age for first visit was 24.33 weeks (*S.D.*= 5.52).[15] Most studies indicated that women who had family support for pregnancy sought antenatal visit earlier than those who lack of family support.[18] Women who lacked support from husband were later in booking ANC than those who were received support,[19] and who received support from mothers and sisters also started ANC visits earlier than women who did not receive support.[20]

Numerous studies in other countries about the factors associated with the timely initiation of ANC were conducted. However, studies about ANC in Vietnam are still limited and there is no study focusing on factors affecting the initiation of ANC. Therefore, the aims of this study are to determine the initiation of ANC and to examine the influence of maternal age, maternal education, parity, knowledge about ANC of the respondents, and family support for pregnancy on timely initiation of ANC. The results of this study are beneficial to the nurses, midwives, and other health care providers. It will help them identify factors that influence women starting ANC early or late, which help them develop interventions in improvement the timely utilization of ANC more effectively.

Conceptual framework of the study

This study used Andersen's Behavioral Model of Health Services Use [21] as the framework because this model had been widely used in many studies in health care use services including ANC. Andersen explained that people use health service depending on three main factors. The first is predisposing characteristics including demographic factors, social structure, and health beliefs. The second is enabling resources including personal/ family and community resources. The last is need factors including perceived individuals and evaluated need by medical care providers. In this study, demographic factors are maternal age and parity; social structure is maternal education; and belief is knowledge about ANC. Enabling resource is the cause of health service use and it is the family support for pregnancy in this study. Many previous studies used this model to identify factors affecting timely initiation of ANC. A study conducted in Northwest Ethiopia used this model as a conceptual framework and indicated that some factors of predisposing and need factors were significantly related to timely initiation of ANC visit such as mothers' age, education and perception[9] Another study conducted in New South Wales, Australia based on this model

concluded that predisposing, enabling, and need factors were associated with late entry to ANC care (Trinh & Rubin, 2006).[11] The findings from these studies contributed to explain the relationships of predisposing, enabling, and need factors on timely initiation of ANC.

Methodology

This predictive correlational study was carried out at Quy Nhon General Hospital, Binh Dinh Province, Vietnam.

Samples: The participants in this study were pregnant women who came to antenatal visit the Antenatal Clinic at Quy Nhon General Hospital in Binh Dinh Province, Vietnam from February to March, 2015. Women were selected if they met the following inclusion criteria: (1) had no severe complications during pregnancy (did not have complications that required hospitalization or restriction of activity); (2) were Vietnamese women and able to communicate, read and write Vietnamese language.

The sample size was estimated by using formula of Tabachnick and Fidell.[22] A simple random sampling technique was used to recruit the sample of 109 pregnant women in this study. Pregnant women who met the eligibility criteria were randomly selected from the list of registered pregnant women at the Antenatal Clinic. On the data collection days, the lists of pregnant women who come for antenatal visit at Antenatal Clinic were obtained, with around 15 pregnant women per day. Names of pregnant women who meet the eligibility criteria were written in the slips of paper, put in a box, and then mixed well. The researcher randomly picked pregnant women names from the box twice per day, around 7 to 8 women were chosen per day.

Instruments: The data for this study were collected by using four self-report questionnaires. The original questionnaires were in English and were translated into Vietnamese language by back-translation technique.[23] The translation procedure was performed by three experts who were bilingual translators, fluent in English and Vietnamese, as well as familiar with the domain of maternal and childbirth.

The personal background questionnaire consisted of 9 questions. It involved personal background of the participants including age, education level, parity and other characteristics of respondents. This questionnaire was developed by researchers based on literature.[13,24,25]

The information about timely initiation of antenatal care was obtained by using two questionnaires. First questionnaire was about the contents of the first ANC visit with 7 items and yes-no answers. These items were used to identify whether a pregnant woman came for receiving ANC or only came for confirming her pregnancy. In this study only pregnant women who came for receiving ANC were recruited. The second questionnaire asked about the gestational age of this pregnancy with the blank to fill. The answer from this questionnaire was categorized into two groups: gestational age of first ANC within 12 weeks and after 12 weeks. The questionnaires were developed by the researchers based on literature.[26] The content validity of these two questionnaires were reviewed by five experts in maternal-newborn nursing. They examined the content and language suitability. The content validity index for the first

questionnaire was 1.0.

The knowledge about ANC questionnaire included 12 items asking about understanding of participants regarding the appropriate time for ANC visit, the benefits and receiving services in ANC, emphasizing on the first ANC. The items had 3 options including true, false, and no idea. Correct answer got 1 score, incorrect answer or no idea got 0 score. The total scores were yielded a minimum of 0 or maximum of 12 points. Higher scores were considered that participants had high knowledge about ANC and lower scores were considered that participants had low knowledge about ANC. This questionnaire was modified by the researchers based on "Knowledge toward ANC" questionnaire, which were developed by Nguyen et al.[13] for accessing postpartum women' knowledge about ANC and based on literature.[26,27] The content validity index for this questionnaire was 1.0 and the reliability .74 which assessed by Kuder-Richardson formula.

The family support for pregnancy questionnaire consisted of 14 questions about support from family for pregnant women. The questionnaire included 3 types of support: emotional support, instrumental support, and informational support. Each question had seven choices of the answer, where scores were given as seven point-Likert scales with strongly disagree = 1, disagree = 2, somewhat disagree = 3, neutral = 4, somewhat agree = 5, agree = 6, and strongly agree = 7. Therefore, 14 questions were yield a minimum of 14 or maximum of 98 points. Higher scores indicated that participants had high family support. The questionnaire was developed by the researchers based on conceptualization of social support by House[28] and literature.[18,27,29,30] The content validity index of the questionnaire was .95 and the Cronbach's alpha coefficient was .81.

Data collection procedures: Data in this study were collected by the researcher. The contingencies have been addressed and the Institutional Review Board approved the protocol at Faculty of Nursing, Burapha University, Thailand. The permission was received from the Director of Quy Nhon General Hospital. The head of midwife in the ANC Clinic was informed about the data collection of this study by the Director of the hospital. In the data collection days, the researcher viewed the list of pregnant women who registering at Antenatal Clinic to identify the women who met eligibility criteria and recruited the participants by using simple random technique. Firstly, the researcher introduced herself, the purposes, benefits, risks of the study and the data collection procedures were also presented to pregnant women. Then, the researcher asked for agreement to become the participants. The human protection was explained, intended times for data collection was informed, and the consent forms were also signed by the participants. The researcher explained to the participants about their right to participate or withdraw from the study at any time. The questionnaires were hand-delivered to the participants for self-completion.

Data analysis: The data were analyzed by using descriptive statistics, Pearson Chi-Square, Point Biserial, and multiple logistic regression. The significant level of statistical test was set up at a level at $p < 0.05$.

Ethical considerations: This study was approved by the Institutional Review Board, Faculty of Nursing, Burapha University (14-01-

2558) and permission for data collection from the Director of Quy Nhon General Hospital (43/CV-TTYT). Written informed consent was obtained from the participants.

Results

There were 109 pregnant women participating in this study. Their age ranged from 19 to 41 years old and the average age was 28.35 years (*S.D.* = 5.13), and most of respondents were married (89.9%). Nearly half of the respondents' education level was above high school (42.2%), and 51.4% of them worked for the government and private companies. About half of them lived in urban (49.5%), and 44% in extended families. Regarding to parity, 40.4% of women was never delivery, in which 33% was the first pregnancy. Although most women realized their pregnancies in the first trimester, but still 9.2% of them knew their pregnancies in the second trimester. The details of personal information of respondents are presented in the Table 1.

Table 1 Frequency and percentage of personal information of the respondents (n = 109)

Characteristics	Frequency	Percentage
Age		
< 35 years old	93	85.3
> 35 years old	16	14.7
Mean = 28.35, SD = 5.13, Minimum = 19, Maximum = 41		
Education[#]		
Less than high school	28	25.7
High school	35	32.1
Higher than high school	46	42.2
Residential area		
Urban	54	49.5
Suburban	27	24.8
Rural	28	25.7
Occupation		
Housewife	21	19.2
Government employee	17	15.6
Private company employee	39	35.8
Own business	21	19.3
Other	11	10.1

Table 1 Frequency and percentage of personal information of the respondents (n = 109) Cont.

Characteristics	Frequency	Percentage
Marital status		
Married	98	89.9
Single/Widowed/Divorced/Separated	11	10.1
Number of pregnancy		
The first pregnancy	36	33.0
The second pregnancy and above	73	67.0
Parity		
0	44	40.4
≥ 1	65	59.6
First know pregnancy		
The first trimester	99	90.8
The second trimester	10	9.2
Family structure		
Nuclear family	61	56.0
Extended family	48	44.0

Regarding the knowledge about ANC of the respondents, it ranged from 4-12 scores, and the mean score was 9.01 (*S.D.* = 1.93). The results showed that most of the respondents knew that they should increase iron and folic acid supplement during their pregnancy (93.6%), and following by knowledge about tetanus vaccine injection for prevention of their babies from tetanus (90.8%). However, only 45.9% of them knew the schedule of ANC visit. Percentages of women have knowledge about the time for the first ANC were nearly the same with blood test for HIV infection (60.0% and 61.5%, respectively). Likewise, the scores of family support for pregnancy ranged from 58 to 98, with mean score was 86.60 (*S.D.* = 6.89). The mean score of item that the respondents can receive support from family if they have pregnant problems was highest (Mean = 6.49, SD = .57), and followed by family members can help pregnant women to seek information about pregnancy care, with the mean score was 6.43 (SD = .58). The lowest mean score was the women receive financial support that they need for pregnancy care (Mean = 5.84, SD = .78).

The results showed that the timely initiation of ANC among pregnant women in Binh Dinh Province ranged from 5 to 30 weeks with the mean of 11.85 weeks (*S.D.* = 5.34) (n = 109). These results also indicated that most of respondents (72.5%) started antenatal visit at the recommended time.

Pearson Chi-Square and Point-Biserial were used to test the correlation between factors and timely initiation of ANC. The results indicated that there were significantly association between maternal

age ($c2 = 27.14$, $p < .001$), educational level ($c2 = 27.07$, $p < .001$), parity ($c2 = 4.99$, $p = .026$), knowledge about ANC ($r_{pb} = .61$, $p < .001$), and family support for pregnancy ($r_{pb} = .56$, $p < .001$) and timely initiation of ANC.

The multiple logistic regression was performed to examine influencing factors of timely initiation of ANC among pregnant women and only significant factors from the Pearson Chi-Square and Point-Biserial test were included in the model. Results showed that significant factors included maternal age, maternal education, parity, knowledge about ANC, and family support for pregnancy. The results in table 2 revealed that the respondents, who in the age group of ≤ 35 years old was statistically significant association with timely initiation of ANC ($AOR = 47.95$, 95% CI = 3.80-605.74, $p = .003$). The odds ratio showed that these women were 47.95 times more likely to have obtained the first ANC visit after 12 weeks compared to the group of older than 35 years old. The results also revealed that knowledge about ANC of the respondents was found to be statistically significant association with timely initiation of ANC among pregnant women ($AOR = .24$, 95% CI = .10-.57, $p = .001$). The odds ratio was .24 indicating that for each one point increase on knowledge about ANC there was .24 times less likely to get ANC after 12 weeks of respondents. Likely, the results indicated that family support for the respondents during pregnancy was found to be statistically significant association with timely initiation of ANC ($AOR = .73$, 95% CI = .57-.95, $p = .020$). It meant that with each one point increasing on the family support for pregnancy, there were .73 times less likely the respondents to get ANC later than the recommended time.

Table 2 The association between significant factors and the timely initiation of ANC of the (n = 109)

Variables	*B*	Exp(*B*)	95% C.I	*p* -value
Age				
≤ 35 years old	3.87	47.95	3.80 – 605.74	.003
> 35 years old		1.00		
Education				
Less than high school	2.62	13.68	.86 – 216.60	.063
High school	2.79	16.29	.94 – 282.95	.055
Higher than high school		1.00		
Parity				
0		1.00		
≥ 1	-1.20	.30	.04 – 2.22	.238
Knowledge about ANC	-1.42	.24	.10 –.57	.001
Family support for pregnancy	-.31	.73	.57 –.95	.020

Discussion

The timely initiation of ANC

This study found that the average gestational age of the respondents at first antenatal visit was 11.85 weeks. This result indicated that pregnant women visiting ANC within 12 weeks had lesser average gestational age compared to many previous studies in Vietnam. The average duration for first ANC visit reported by a previous study in Vietnam was 3.7 months (15 weeks)[12] which was relatively higher than the current study. In addition, other studies in Nigeria and Uganda showed the average age of the first ANC as 24.33 weeks[15] and 27.9 weeks[8]. The present study also indicated that most of pregnant women started ANC within 12 weeks (72.5%). This result presented that percentage of pregnant women in this study initiated ANC in the first trimester was higher than previous study by Cresswell and colleagues in the United Kingdom[31] which 62.5% visited ANC in the first trimester. It was also far higher than some studies in other developing countries including Nigeria (16.95%)[15] and Rwanda (5%).[32] Regarding to the percentage of initiation of ANC in Vietnam, this result was higher compared to 69.1% in a previous study in Vietnam.[14] This result was consistent with a collection and review research period of 2006-2010 in Vietnam, which 50-80% pregnant women started ANC in the first three months.[5] Compare with the previous studies in Vietnam and other developing countries, the average gestational age of initiated ANC in this study was lower, and percentage of women tend to start ANC within 12 weeks were increas. The reasons for good signs might be the communication and health education to people about the benefits of early ANC is increasingly popular and effective. In Vietnam, the medical network in the locals are quite good, each medical staff at the grassroot level will supervise and support for pregnant women in their area, they give advices for pregnancy care appropriately for women. In addition, Vietnam's health insurance is covered almost the entire population and the ANC is one of the free list if women have health insurance cards. Besides, according to the Population Policy in Vietnam, each family only has from 1 child to 2 children. Thus, pregnancy and prenatal care are also more interesting and more care is taken in many Vietnamese families.

Factors predicting timely initiation of ANC

The average age of the respondents was 28.35 years old with 85.3% of them in the age group of ≤ 35 years old. The Pearson Chi-Square test indicated that age was strongly significant association with the timely initiation of ANC ($c2 = 27.14$, $p < .001$). The multiple logistic regression revealed that there was a significant association between the age of respondents and timely initiation of ANC (*AOR* = 47.95, 95% CI = 3.80-605.74, $p = .003$). Pregnant women who ≤ 35 years old were 47.95 times more likely to start ANC visit late compared with older women. This finding was consistent with other research in Australia, in which women in the age of forties and fifties were .91 times less likely booked ANC late compare to women in the age of thirties (OR = .91, $p = .022$),[11] and also nearly the same with a study in United Kingdom by Baker and Rajasingam[10], in which women's age more than 35 were less likely to book late compared to group of 25-29 (group of 35-39: OR = .791, $p = .009$,

group: 40-49: OR = .701, p = .012). The present study was slight difference with a previous study, which the age was not associated with initiate booking of respondents ($c2$ = 5.88, p = .317).[15] The findings in this study might be explained that women, who are older than 35 years old more likely are multiparous women than younger. Therefore, they have more experience to recognize their pregnancies earlier. Moreover, older women usually have knowledge to realize they are in the group of high risk pregnancy. Thus, they go to ANC earlier than other groups.

Educational level and parity of respondents in this study were significantly association with the timely initiation of ANC. However, these factors did not predict the timely initiation of ANC. These findings were consistent with some previous studies which were conducted by Onoh et al.[15] and Gross et al.[19] The reasons for the results of this study might be the education about antenatal may not have been much mentioned in the schools. Concerning the parity, traditionally, Vietnamese women in the first child birth often seek advices for pregnancy care from other women including mothers, older sisters, friends who are considered to have experience of childbirth. Eventually, in mostinstances, the initiation time of ANC is not much depending on the parity as can be seen in this study.

The finding from this study showed that knowledge about ANC of respondents was significantly association (r_{pb} = .61 and p <.001) and strongly predictor on timely initiation of ANC (AOR = .24, 95% CI =.10-.57, p = .001). The result indicated that for each one point increase on know ledge about ANC there was .24 times the pregnant women were less likely to start ANC late. This finding was consistent with a study by Banda et al.[33], which reported that pregnant women who adequate knowledge were more likely to initiate ANC within recommended time 2.2 times compared to those without (AOR = 2.205, 95% CI = 1.021-4.759). Another study also indicated that women had know ledge about time of booking were 1.5 times more likely to book earlier than lack of knowledge (AOR = 1.50, 95% CI = .72-3.11).[25] One of the reasons for the late prenatal care among women is that they might lack knowledge of maternity care to realize that they are pregnant later than those with good know ledge. By contract, pregnant women who have good knowledge will have good perception about the benefits of antenatal care. Thus, they will attend ANC early. Therefore, it could be concluded that health education could be important in the improvement of timing of ANC attendance. Improving knowledge about prenatal care for women is an important factor to reduce the incidence of late antenatal women. Moreover, enhanced knowledge will make better health care for women.

Concerning to family support for pregnancy, there was strongly statistically significant association between family support for pregnancy and timely initiation of ANC, which odds ratio was .73 (p = .020). This finding was explained that for each one point increase in family support for pregnant women there were less likely .73 times to initiate ANC late. This was consistent with a study of Gross et al.,[19] which presented that women who lack of support from husbands or partners were booking ANC almost 3 weeks later than women who did receive such support (p =.035). Another study by

Rowe and colleagues[34] also was line with present study, which women who did not receive support from family were 2.74 times more likely start ANC late. But there was slightly difference with previous studies, a qualitative study reported that lesser than half of women (10/24) notified that women's decision about ANC visit were by themselves, not much influencing by advices from their husbands or mothers.[35] The present study showed the important role of the family members in prenatal care, they have contributed improving the time of women attending antenatal clinics. Therefore, one of the strategies to increase the percentage of mothers attending antenatal clinics early was education for family members about pregnancy care, to help them recognize their roles and responsibilities in pregnancy care, encourage them to accompany women to antenatal clinics, and listen to the result of the ANC and planning for pregnancy care from health care providers. Thus, they can share about pregnancy care and more support for women during pregnancy.

Lastly, the findings of this study could be evidence to support validity of Andersen's Behavioral Model of Health Services Use. Antenatal care is an important component of women's health care; it is more effective if was occurred early. This study demonstrated that pregnant women who in the group of high risk pregnancy age, high knowledge about ANC and had more support from family were more likely to start ANC early. These factors of Andersen's Behavioral Model were demonstrated as predictors for timely initiation of ANC in previous studies[9,11,25] which results were consistent with the present study.

Implications

The findings of the study show that women with higher knowledge would attend ANC early than other group. Besides, a woman had decisions about pregnancy care not only by herself alone but also based on her family's advices and support. Therefore, in the preconception care classes, or counseling about pregnancy care, the nurses and midwives should not only focus on women but also need to encourage other family members to attend the classes. They would play an important role as contributing to improve the health care for women during pregnancy. There were some women came for pregnancy care rather late because they recognized their pregnancy late or they did not know the time for starting ANC. Thus, in the preconception care classes, the nurses or midwives need to explain in detail for women about signs of pregnancy and plans for pregnancy care.

Limitation and recommendations

Results of this study serve as the basic for further research, especially studies in Vietnam that were still lack of information supporting about antenatal services. However, the limitations of this study should be noted. In this study, the researcher could not collect the data with teen pregnancies because they did not come for ANC at that time. The lack of an age group is a limitation of this study. This study focused on some factors predicting timely initiation of ANC. Future research should examine other factors that might influence to the time of first ANC visit. This study was conducted in the central of Vietnam, so future study should be conducted to compare the ANC utilization between areas in Vietnam.

Conclusion

The initiation of ANC in the recommended time is widely acknowledged to have immense health benefits for fetus, mother, and society. Examining factors predicting timely initiation of ANC is important considerations in impact to the initiation time of ANC. The fact that all independent variables (age, education, parity, knowledge about ANC, and family support) were significantly associated on attended time of ANC. In which, age of respondents, knowledge about ANC, family support for pregnancy were predictors of timely initiation of ANC. From the results of this study the intervention programs should pay attention on these factors to help improve the timely initiation of ANC for women.

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