FACTORS AFFECTING TIME TO START ANTENATAL CARE IN MAHASARAKHAM PROVINCE, THAILAND

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Thesis
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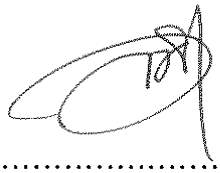

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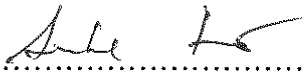

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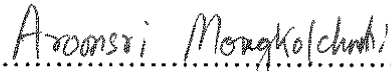

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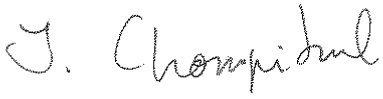

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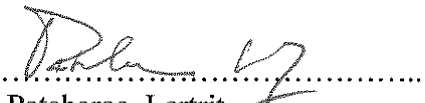

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FACTOR ASSOCIATING TIME TO START ANTENATAL CARE IN MAHASARAKHAM PROVINCE, THAILAND

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ABSTRACT

This cross-sectional descriptive study aimed to determine the factors that affect postpartum women time to start Antenatal Care (ANC) in Mahasarakham province in Thailand. The Sample was 537 postpartum women participants who had had babies delivered in all hospitals of Mahasarakham Province selected, using stratified sampling with proportional to size. Data were collected using structured questionnaires and from maternal and child health handbooks filled by the coordinators. Descriptive statistics were used to describe the basic information, chi-square test and a multiple logistic regression were performed with significant level set at p-value=0.05.

This study found that 99.6 % of the postpartum women took at least one (1) ANC visit before delivery. Forty nine point six percent (49.6%) started ANC late and 18.6% were teenage pregnancies. Awareness of the right time to start ANC was only 6.6%. Teenage pregnancy and Universal Coverage (UC) righted health insurance were statistically significant predictors for late ANC.Teenage pregnanciess were 2.39 times (AOR 2.39, 95% CI 1.31-4.34, p-value=0.004) more likely to start ANC later than adults. UC-righted postpartum women were 1.66 times (AOR 1.66, 95% CI 1.11-2.49, p-value=0.013) higher to start ANC late than non-UC-righted health insurance.

Since teenage pregnancy is one of the most serious problems, all stakeholders should integrate all strategies. The right time to start ANC should be publicized and made clear for everyone to understand.

KEY WORDS: TIME TO START ANTENATAL CARE / LATE ANC

73 pages

ปัจจัยที่มีผลต่ออายุครรภ์ที่เริ่มฝากครรภ์ในหญิงหลังคลอด จังหวัดมหาสารคาม
FACTOR ASSOCIATING TIME TO START ANTENATAL CARE IN MAHASARAKHAM PROVINCE, THAILAND

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บทคัดย่อ

การศึกษานี้เป็นการวิจัยเชิงสำรวจเพื่อหาปัจจัยที่มีผลต่ออายุครรภ์ที่เริ่มฝากครรภ์ในหญิงหลังคลอด จังหวัดมหาสารคาม จำนวน ๕๓๗ คนที่คลอดในจังหวัดมหาสารคามระหว่างวันที่ ๑ มิถุนายน ถึง ๑๕ ธันวาคม พ.ศ. ๒๕๕๗ โดยใช้แบบสอบถามและข้อมูลในสมุดคู่มืออนามัยแม่และเด็ก วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและวิเคราะห์ปัจจัยที่มีความสัมพันธ์ด้วยสถิติถดถอยพหุคูณ (Multiple logistic regression)

ผลการศึกษาพบว่า หญิงหลังคลอดที่ศึกษามีการฝากครรภ์อย่างน้อย ๑ ครั้งก่อนคลอด ๙๙.๖%, ฝากครรภ์ช้า ๔๙.๖% และเป็นการตั้งครรภ์ในวัยรุ่น ๑๘.๖% การรับรู้อายุครรภ์ที่ควรเริ่มฝากครรภ์ที่ถูกต้องเพียง ๖.๖% ปัจจัยที่มีผลต่อการฝากครรภ์ช้าอย่างมีนัยสำคัญทางสถิติได้แก่การตั้งครรภ์ในวัยรุ่น (AOR 2.39, 95% CI 1.32-4.34, p-value=0.004) และผู้มีสิทธิ์ในการรักษาพยาบาลในระบบหลักประกันสุขภาพถ้วนหน้า (AOR 1.66, 95% CI 1.11-2.49, p-value=0.013)

ดังนั้นปัญหาการตั้งครรภ์ในวัยรุ่นควรได้รับการบูรณาการแผนงานของผู้เกี่ยวข้องในทุกระดับทั้งหมดเพื่อให้การแก้ไขเป็นไปในทางเดียวกัน และควรมีการประชาสัมพันธ์ถึงอายุครรภ์ที่ควรเริ่มฝากครรภ์แก่สาธารณชนทั่วไปได้รับรู้และเข้าใจ หญิงหลังคลอดสิทธ์ประกันสุขภาพถ้วนหน้าควรได้มีการศึกษาเพิ่มเติมถึงสาเหตุที่แท้จริงในการเป็นกลุ่มเสี่ยงที่มีการเริ่มฝากครรภ์ช้า.

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INTRODUCTION

1.1 Rationale and justification

Maternal mortality is still a problem of the world [1]. WHO (World Health Organization) reported that estimated 358,000 maternal deaths occurred worldwide in 2008. Developing countries continued to account for 99% (355,000) of the deaths. Sub-Saharan Africa and South Asia accounted for 87% (313,000) of global maternal deaths. Among developing regions, sub-Saharan Africa had the highest maternal mortality ratio (MMR)[1,2]) at 640 maternal deaths per 100, 000 live births in 2008, followed by South Asia (280), Oceania (230), South-Eastern Asia (160), North Africa (92), Latin America and the Caribbean (85), Western Asia (68), and Eastern Asia (41) while MMR in developed countries were only 14 [2].

The reduction of maternal deaths is a high priority for the international community, especially in view of the increased attention on the Millennium Development Goals (MDG5) [3]. WHO tried to find out the causes by undertake a systematic review to determine the distribution of causes of maternal deaths. They found that hemorrhage was the leading cause of death in Africa and in Asia. In Latin America and the Caribbean, hypertensive disorders were responsible for the most deaths. Abortion deaths were the highest in Latin America and the Caribbean. Deaths due to sepsis were higher in Africa, Asia, and Latin America and the Caribbean than in developed countries. They assumed that hemorrhage and hypertensive disorders are major contributors to maternal deaths in developing countries [4]. Most maternal deaths occur during childbirth and the presence of trained medical staff could greatly reduce this number [5].

In 2003 Health Evidence Network (HEN) synthesis report on the efficacy/effectiveness of antenatal care by a large number of systematic reviews of the evidence concerning the value of antenatal care. It reported that many studies had clearly demonstrated that antenatal care prevents health problems for both mother and

child but many antenatal interventions were unnecessary or of unproven benefit and too expensive [6]. So WHO advised new model of antenatal care for developing countries which more simple, cheaper and without unnecessary intervention. It reduced number of antenatal care visits of normal pregnancy from more than 12 times in standard model to only 4 times in the new WHO model with the same outcomes. Four times of antenatal care visits in new WHO model composed of: first visit at gestational age under 12 weeks, second visit at gestational age 26 weeks, third visit at gestational age 32 weeks and fourth visit at gestational age 36 or 38 weeks [7].

During antenatal care, health care providers monitor the health of the mother and baby and identify and treat health conditions and issues that could impact the pregnancy. It is also an important time for providers to educate mothers on a variety of health issues related to pregnancy, such as smoking, alcohol use, exercise, nutrition, preparing for childbirth, infant care and breast feeding. Antenatal care is more likely to be effective if it is initiated early in pregnancy [8]. Women who start antenatal care in the last trimester are more likely to have babies with health problems. Women who receive no antenatal care are more likely to have low birth weight babies, and these babies are at greater risk of dying [9].

Early entry to antenatal care is important for early detection and treatment of adverse pregnancy related outcomes [10]. Women are advised to attend antenatal care early in order to early health education and counseling on expected physiological changes, the normal course and possible complications of pregnancy. It aids early documentation of the woman's baseline physiological and laboratory parameters for subsequent comparison and early detection of anomalies with the progress of pregnancy [11]. It also provides opportunities for preventive health care services such as immunization against neonatal tetanus, prophylactic treatment of malaria through the use of intermittent presumptive treatment approach, and HIV counseling and testing [12]. Another advantage is the early detection of modifiable pre-existing medical conditions that may influence the course and outcome of pregnancy such as hepatitis B infection, syphilis[13], severe thalassemia [14], cervical incompetence, chronic hypertension and diabetes mellitus[11,12]. They also have early supplement of vitamins and minerals such as ferrous, folic acid and iodine [14-19].

Many studies indicated that in developing countries most women start entry to antenatal care late contrast with findings in most developed countries. Okunolola et al and Adekanle and Isawumi reported prevalence of late booking of 86% and 82.6% respectively from south western Nigeria [20, 21]. Ebeigbe and Igberase similarly reported an incidence of 79.9% in the Niger Delta [22]. While Redshaw, M., & Heikkila, K. reported late booking at 15% in the general population of UK [23]. California Department of Public Health reported 16 % in USA (2009) [24]. In South-east Asia, study in Lao (2010) reported late booking of 60.1% [25], in Vietnam (2006) reported 59%. [26]

In Thailand, report from Saiyairakhospital.com in 2011 showed that MMR in the country was about 11.4 per 100, 000 live births, late antenatal care was about 57.1% [27]. At the same time in Mahasarakham province, MMR was about 32.76 per 100, 000 live births and late antenatal care about 67.3% while the national target was set at < 18 per 100, 000 live births in MMR and < 40 % for late antenatal care. [27, 28] This showed that maternal and child health problem was not serious in the national level but still severe problem in Mahasarskham province. There were many studies about the factors associate with late antenatal care. These factors included age [13, 29-33], marital status [13, 31, 34], parity of gestation [30, 34-36], ethnic minority [29-31, 37-40], religion [33], low income [13, 34], education of pregnant woman [32, 41] and husband [32], perception about antenatal care [42-44], perception about contraception [45], easy access to services [46], family and friends support [47] etc. Similarly, unwanted pregnancy [48-50], awareness of pregnancy [49], irregular menstruation period [29, 51] and irregular family planning [40] also aroused late antenatal care. There was limitation of study about the relations between factors and time to start antenatal care in Thailand before but there is a need to study to find the causes of problems for solving. Therefore, this study aims to investigate the factors affecting time to start antenatal care of postpartum women for improvement of antenatal care system in Mahasarakham province afterwards. And the benefit of this study may increase rate of early starting antenatal care in pregnant women and reduce MMR in Mahasarakham province in the future.

1.2. Research questions

What are the factors affecting time to start antenatal care among postpartum women in Mahasarakham province, Thailand?

1.3 Objectives of the study

1.2.1. General objectives

To determines the factors that affect time to start antenatal care among postpartum women in Mahasarakham province, Thailand

1.2.2. Specific objectives

- To describe time to start antenatal care among postpartum women in Mahasarakham province, Thailand.
- To determine the relationship between predisposing characteristics and time to start antenatal care
- To determine the relationship between enabling resources and time to start antenatal care
- To determine the relationship between needs factors and time to start antenatal care

1.4. Conceptual framework

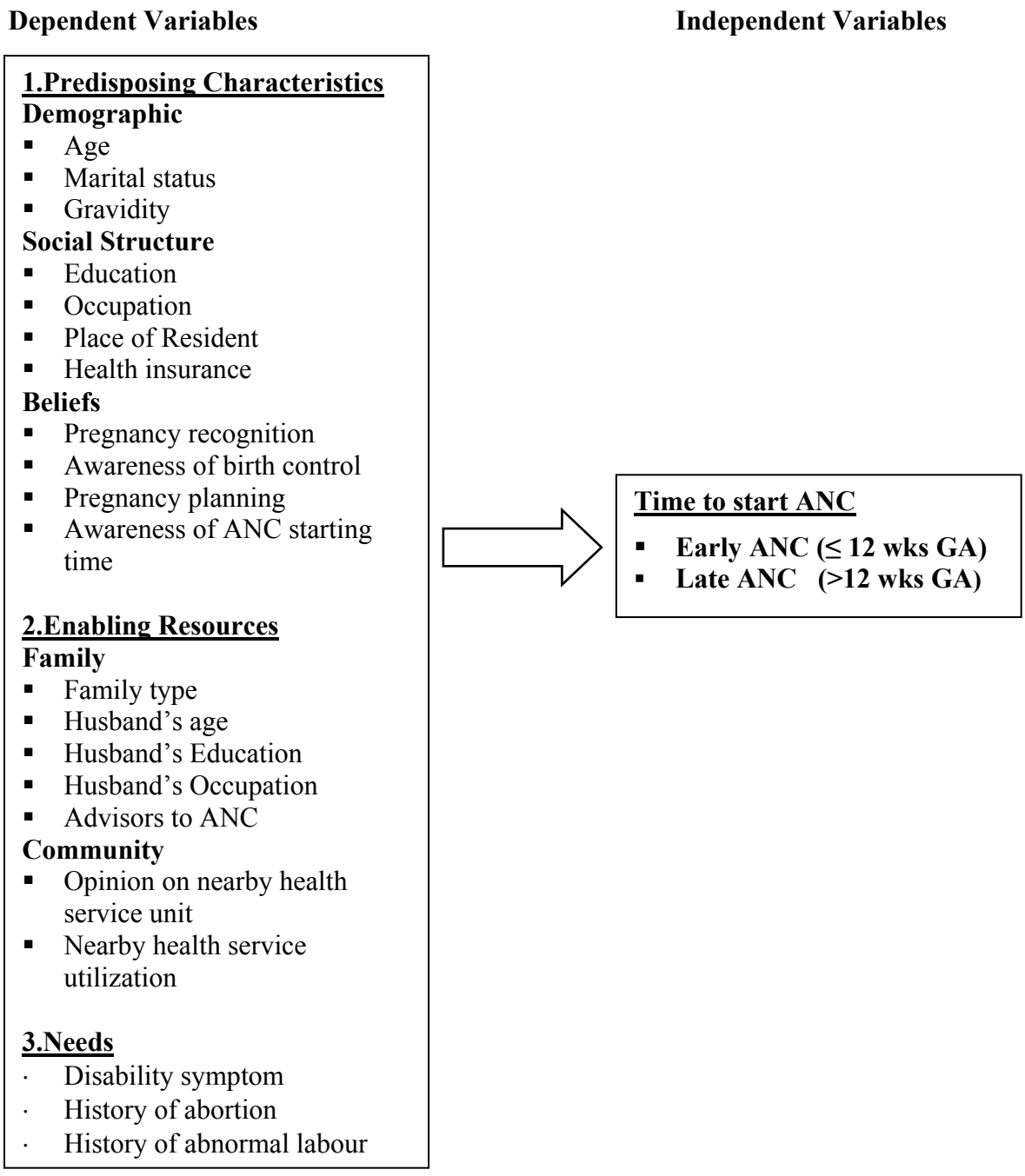

Figure 1.1 Conceptual framework

1.5. Variables and operational definitions

1.4.1. Dependent variables: time to start antenatal care was defined by gestational age at the first visit of antenatal care that was recorded in maternal and child health handbook.

1. Early antenatal care refers to gestational age at first visit ≤ 12 weeks.

2. Late antenatal care refers to gestational age at first visit > 12 weeks of gestational age.

1.4.2. Independent variables

1. Predisposing characteristics
    - 1.1 Demographic characteristics
    - 1.2 Social structure
    - 1.3 Beliefs
2. Enabling resource
    - 2.1 Family
    - 2.2 Community
3. Needs
    - 3.1 Disability symptom
    - 3.2 History of abortion
    - 3.3 History of abnormal labour

1.1. Demographic characteristics

a. Age: refers to the ages in complete years of the postpartum women at the time of delivery; defined as teenage group (<20 yrs) and adult group (≥ 20 yrs)

b. Marital status: refers to whether a women was married or unmarried ~~woman~~ at the time of delivery; defined as singled (unmarried, divorced, widowed or separated) and coupled (married)

c. Gravidity: refers to the number of times of having pregnancy; categorized as primigravida (1st gravidity) and multigravida (2nd or more)

1.2. Social structure

a. Education: refers to the highest education level a woman attained at the time of delivery; categorized as high (upper secondary level and above) and low (lower secondary level and below)

b. Occupation: refers to the main type of work a woman did to get income; defined as employed (working) and unemployed (no working)

c. Place of resident: refer to living home of a woman at the time of delivery; defined as urban (Muang Mahasarakham district) and rural (other districts)

d. Health assurance: refers to right of health facility from different sources: Universal Coverage Fund, Social Security Fund and Civil Official And State Enterprise Fund

1.3. Beliefs

a. Pregnancy recognition: refers to gestational age when the woman accepted that she was pregnant; defined as early (≤ 12 wks) and late (>12 wks)

b. Awareness of birth control: refers to contraception use before got pregnant; defined as yes or no

c. Pregnancy planning: refers to intention and satisfaction of the women about this pregnancy; defined as planned or unplanned

d. Awareness of antenatal care starting time: knowledge of woman about when should start antenatal care; defined as yes or no

2.1. Family

a. Family type: refers to nuclear family: composed of single married couple and their unmarried children, and joint family: composed of 2 or more married couples and their unmarried children who were related either lineally or collaterally

b. Husband's education level: refers to the highest education level a woman's husband attained at the time of delivery; categorized as high (upper secondary level and above) and low (lower secondary level and below)

c. Husband's occupation: refers to the main type of work a woman's husband did get income; defined as employed (working) and unemployed (no working)

d. Advisor to antenatal care: a person who advised the woman to start antenatal care; defined as husband, parents and none

2.2. Community

a. Opinion on nearby health service unit: recognition that nearby health office can provide quality antenatal care services or not; defined as yes or no

b. Nearby health service utilization: refers to usage of nearby health service in further antenatal care visit; defined as yes or no

3. Needs

3.1 Disability symptom: illness or discomfort symptom before antenatal care such as morning sickness, vaginal bleeding, abdominal pain; defined as yes or no

3.2 History of abortion: outcomes were abortions in any previous pregnancies; defined as yes or no

3.3 History of abnormal labour: abnormal delivery in any previous pregnancies; defined as yes or no

1.6. Expected outcome

The purpose of the study was to determine significant factors influencing postpartum women to lately start antenatal care services. Therefore, the study results would support in designing new strategies to increase rate of early antenatal care in Mahasarakham province, Thailand.

1.7. Limitation of the study

This study was conducted using self- administered questionnaires among postpartum women. Some of them did not answer completely. It might be possible that they did not clearly understand or misunderstood the questions such as number of gravidity, awareness of birth control, and questions about parent. Furthermore, they had right to skip or refuse answering questions when they felt uncomfortable or did not want to answer the questions such as marital status, planned or unplanned pregnancy. These might lead to many missing answers in some questions.

This study defined the first visit antenatal care when it was recorded in maternal and child health handbook. Some postpartum women utilized their first visits in private clinics but no records in handbooks, so these were not judged as first antenatal care visits for this study although they under stood that they had early antenatal care already.

The research design of this study was cross-sectional and recall for antenatal care utilization during the previous several months ago so there might be a recall bias in postpartum women's memories about time and number of antenatal care visits. Especially about last menstruation period date for estimated gestational age, many of them did not remember so certain gestational age could not be defined. Therefore, it was very difficult to categorize when uncertain gestational age was about 83 – 85 days at first antenatal care visit.

The data was collected by coordinators in each hospital, some of them did not pay attention to recheck or evaluate it. Therefore, some questionnaires did not fill completely; especially date of first antenatal care, date of last menstruation period or number of visits. Some unreasonable data was found such as start first visit before delivery about 2 months but numbers of visits more than 10 times. This might be possible that coordinator training was not insufficient either or the questionnaires were not clear for understanding.

CHAPTER II
LITERATURE REVIEW

Overview

"Trends in Maternal Mortality: 1990 to 2008" **World Health Organization 2010** reported that:

The 2015 deadline to achieve the Millennium Development Goals (MDG) adopted at the 2000 Millennium Summit. There were two targets for assessing progress in improving maternal health (MDG 5): reducing the maternal mortality ratio (MMR) by three quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015. Closer examination of maternal mortality levels was needed to inform planning of reproductive health programs, to guide advocacy efforts and research at the national and international levels, and to inform decision-making for the achievement of MDG 5. To be useful for the latter purpose, the country estimates must be internationally comparable. It had been a challenge to assess the extent of progress towards the MDG 5 target due to the lack of reliable and accurate data on maternal mortality, particularly in developing-country settings where maternal mortality was high. The World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the United Nations Population Fund (UNFPA) had previously published internationally comparable estimates of maternal mortality for 1990, 1995, and 2000. In 2005, the three agencies, along with The World Bank, developed country, regional, and global estimates and made the first attempt to assess trends in MMR at the regional and global levels. As an update to this ongoing effort, the four agencies presented the global maternal mortality data for 2008 as well as for years 1990, 1995, 2000, and 2005. These estimates revised and improved upon the earlier methodology used.

An estimated 358,000 maternal deaths occurred worldwide in 2008, a 34% decline from the levels of 1990. Despite this decline, developing countries continued to account for 99% (355,000) of the deaths. Sub-Saharan Africa and South Asia

accounted for 87% (313,000) of global maternal deaths. Eleven countries including Afghanistan, Bangladesh, the Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenya, Nigeria, Pakistan, Sudan, and the United Republic of Tanzania, comprised 65% of all maternal deaths in 2008. [1, 2]

The MMR in 2008 was highest in developing regions contrast to developed regions [10] and countries of the Commonwealth of Independent States [38]. Among developing regions, sub-Saharan Africa had the highest MMR at 640 maternal deaths per 100,000 live births in 2008, followed by South Asia (280), Oceania (230), South-Eastern Asia (160), North Africa (92), Latin America and the Caribbean (85), Western Asia (68), and Eastern Asia (41). Forty-five countries had high estimated MMR (MMR ≥300) with four countries (Afghanistan, Chad, Guinea-Bissau, and Somalia), having extremely high MMR (MMR ≥1000). Outside of sub-Saharan Africa, the seven countries with high MMR were: Afghanistan (1400), the Lao People's Democratic Republic (580), Nepal (380), Timor-Leste (370), Bangladesh (340), Haiti (300), and Cambodia (290) [1]. The reduction of maternal deaths is a high priority for the international community, especially in view of the increased attention on the Millennium Development Goals (MDG5) [2]

"The Millennium Development Goals (MDGs)" [3] were eight international development goals that were officially established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. All 189 United Nations member states and at least 23 international organizations had agreed to achieve these goals by the year 2015. The goals were:

1. Eradicating extreme poverty and hunger,
2. Achieving universal primary education,
3. Promoting gender equality and empowering women,
4. Reducing child mortality rates,
5. Improving maternal health,
6. Combating HIV/AIDS, malaria, and other diseases,
7. Ensuring environmental sustainability, and
8. Developing a global partnership for development.

There were two targets for assessing progress in improving maternal health (MDG 5): reducing the maternal mortality ratio (MMR) by three quarters between 1990 and 2015, and achieving universal access to reproductive health by 2015.[1]

"Maternal mortality ratio (per 100,000 live births)" [1]

Rationale for use: Complications during pregnancy and childbirth are a leading cause of death and disability among women of reproductive age in developing countries. The maternal mortality ratio represents the risk associated with each pregnancy, i.e. the obstetric risk. It is also a MDG indicator.

Definition: **Maternal death** is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. To facilitate the identification of maternal deaths in circumstances in which cause of death attribution is inadequate, a new category has been introduced: Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

Definition: **Live birth** refers to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life - e.g. beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles - whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born. [2]

WHO tried to find out the causes by undertake a systematic review to determine the distribution of causes of maternal deaths. It found that hemorrhage was the leading cause of death in Africa (point estimate 33.9%, range 13.3–43.6; 8 datasets, 4,508 deaths) and in Asia (30.8%, 5.9–48.5; 11 datasets, 16,089 deaths). In Latin America and the Caribbean, hypertensive disorders were responsible for the most deaths (25.7%, 7.9–52.4; 10 datasets, 11,777 deaths). Abortion deaths were the highest in Latin America and the Caribbean (12%), which can be as high as 30% of all deaths in some countries in this region. Deaths due to sepsis were higher in Africa (OR 2.71), Asia (OR 1.91), and Latin America and the Caribbean (OR 2.06) than in

developed countries. It interpreted that hemorrhage and hypertensive disorders are major contributors to maternal deaths in developing countries. [4]

Antenatal care, also known as prenatal care, was the interventions that a pregnant woman received from organized health care services. The purpose of antenatal care was to prevent or identify and treat conditions that may threaten the health of the fetus/newborn and/or the mother, and to help a woman approach pregnancy and birth as positive experiences. A large extent antenatal care could contribute greatly to this purpose and could in particular help provide a good start for the newborn child. Many studies had clearly demonstrated that antenatal care prevented health problems for both mother and child but many antenatal interventions were unnecessary or of unproven benefit and too expensive [6]

WHO advised new model of antenatal care for developing countries which more simple, cheaper and without unnecessary intervention. It reduced number of antenatal care visits of normal pregnancy from more than 12 times in standard model to only 4 times in the new WHO model with the same outcomes [7].

"New WHO Antenatal Care Model"

Every pregnant woman will be screened by classifying form [Appendix B] on antenatal care for the first time. Who with history of any risk factors will be sent to doctors for diagnosis risk that has been detected. The appointment follows the pattern of the disease or the treatment of such facilities in clinics. The pregnant women who were not found any risks in histories will receive routine antenatal care (called the basic component). The activities included in the basic component fall within three general areas:

1. Screening for health and socio-economic conditions likely to increase the possibility of specific adverse outcomes.
2. Providing therapeutic interventions known to be beneficial.
3. Educating pregnant Women about planning for safe birth, emergencies during pregnancy and how to deal with them.

The activities distributed over the four visits are presented in the basic component checklist [Appendix B] which each visit composes of

1. General information
2. Physical examination

3. Laboratory

4. Assess for risks or complications to refer

5. Provide care

6. Advice, questions and answers. Date and time of next appointment

7. Complete both clinic records and maternal-child health books.

Content of the first visit (<12 weeks)

a) General information: personal history, medical history, Obstetric history

b) Perform physical examination

· Check for signs of severe anaemia: pale complexion, fingernails, conjunctiva, oral mucosa, tip of tongue and shortness of breath.

· Record weight (kilograms) and height (metres) to assess the mother's nutritional status.

· Measure blood pressure.

· Chest and heart auscultation.

· Measure uterine height (in centimetres). A chart should be used to determine uterine height.

· Consider vaginal examination (using a speculum), especially if any of the conditions listed under "Assess for referral" below are positive and indicate the need for performing a pap smear.

c) Perform the following tests:

- Urine: multiple dipstick test for bacteriuria and test for proteinuria to all women.
- Blood: syphilis (rapid test) result while waiting in the clinic. If positive, treat.
- Blood-group typing (ABO and rhesus).
- Haemoglobin (Hb): only if there are signs of severe anaemia.

d) Assess for referral

Determine the expected date of delivery based on LMP and all other relevant information. Use 280-day rule (LMP + 280 days). Some women will refer to the date of the first missed period when asked about LMP, which may lead to miscalculation of term by four weeks.

Determine whether the woman is eligible for the basic component of the new WHO model or if she is in need of special care and/or referral to a specialized clinic or hospital.

- If the following conditions are diagnosed, proceed as recommended:
- Diabetes: refer; must have continued higher level care.
- Heart disease: refer; continue according to severity and specialist's advice.
- Renal disease: refer; continue according to specialist's advice.
- Epilepsy: give advice on continued medication.
- Drug abuse: refer for specialized care.
- Signs of severe anaemia and Hb <70 g/l : Increase iron dose, or refer if shortness of breath.
- HIV positive: counsel on safe sex practices as well as to the baby and partner(s), and refer for treatment and prevention of mother-to-child transmission of HIV
- Family history of genetic disease: refer.
- Primigravida: give advice on the benefits of institutional delivery.
- Previous stillbirth: refer to continue according to specialist's advice.
- Previous growth-retarded fetus (validated IUGR): refer to higher level of care and continue according to specialist's advice.
- Hospital admission for eclampsia or pre-eclampsia: refer; continue according to specialist's advice.
- Previous caesarean section: stress hospital delivery.
- High blood pressure (>140/90 mm Hg): refer for evaluation
- Body Mass Index (BMI) refer for nutritional evaluation if BMI (weight in kg/height m^2): <l8.5 or >32.3 kg/m^2. Please note that these cut-off points may require local validation. If a local weight-for-height reference chart is available, it can be incorporated into the clinical procedures. If this is not the case, pre-pregnancy maternal weight (using local cut-off points) is recommended for evaluation of the patient's nutritional status during the first antenatal visit.

e) Implement the following interventions:

- Iron and folate supplements to all women: one tablet of 60-mg elemental iron and 250 micrograms folate one-two times per day. If Hb <70 g/1: double the dose
- If rapid test for syphilis is positive: treat.
- Tetanus toxoid: first injection.
- In malaria endemic areas: sufadoxine/pyrimethamine, three tablets once in second trimester and repeat in third trimester (check current recommendations for timing and dosage).
- Refer high-risk cases, according to diagnosis(es) made in Assess for referral above.

f) Advice, questions and answers, and scheduling the next appointment

- Give advice on safe sex. Emphasize the risk of acquiring or transmitting HIV or STIs without the use of condoms.
- Advise women to stop the use of tobacco (both smoking and chewing), alcohol and other harmful substances.
- Advise on breast feeding:

> When to stop breast feeding previous child.

> When to begin breast feeding the expected child.

- Give advice on whom to call or where to go in case of bleeding, abdominal pain and any other emergency, or when in need of other advice. This should be confirmed in writing in the antenatal card.
- Request the woman to record when she notes the first fetal movement.
- Give advice on birth plan, including special transport to delivery institution.
- Questions & answers: time for free communication.
- Advise the woman to bring her partner (or a family member or friend) to later antenatal care visits so that they can be involved in the activities and can learn how to support the woman through her pregnancy.
- Schedule appointment: second visit, at (or close to) 26 weeks: state date and hour. This should be written in the woman's antenatal card and in the clinic's appointment book.

g) Maintain complete records

· Complete clinic record.

· Complete home—based record or antenatal card. Give the record or antenatal care card to the patient and advise her to bring it with her to all appointments she may have with any health services. [7]

"Antenatal care in Thailand" [Appendix C]

In Thailand, they changed the number of antenatal care times from 4 times to 5 times by adding another time at gestational age 20 weeks with abdominal ultrasound. Because of high incidence of thalassemia diseases in Thailand[52], in first visit all pregnant women will get blood concentration (Hct/ Hb) and thalassemia screening tests (OF or MCV and DCIP) [14]. And all of them will receive iodine supplement 200 – 250 microgram/day throughout pregnancy period for prevention of congenital hypothyroidism [14, 17-19].

"Time to start antenatal care"

Women who started antenatal care in the last trimester are more likely to have babies with health problems. Women who received no antenatal care were more likely to have low birth weight babies, and these babies were at greater risk of dying [9]. Antenatal care was more likely to be effective if it is initiated early in pregnancy [8].

There were many definitions for adjusting between early and late antenatal care beyond purpose of the studies. Early antenatal care for developed countries was first visit within 12 weeks GA, WHO guideline for developing countries was within 17 weeks GA. Furthermore, New South Wales (in Australia) classification was within 20 weeks GA. [31]

Late antenatal care is one of the problems in maternal and child health. Many studies indicated that in developing countries most women start entry to antenatal care late contrast with findings in most developed countries. Okunolola et al and Adekanle and Isawumi reported prevalence of late antenatal care of 86% and 82.6% respectively from south western Nigeria [20, 21]. Ebeigbe and Igberase similarly reported an incidence of 79.9% in the Niger Delta [22]. While Redshaw, M., & Heikkila, K. reported late booking at 15% in the general population of UK [23]. California Department of Public Health reported 16 % in USA (2009)

[24]. In South-east Asia, study in Lao (2010) reported late booking of 60.1% [25] and in Vietnam (2006) reported 59%[26].

In Thailand (2011), national late antenatal care was about 57.1% and late booking in Mahasarakham Province was 67.3% [27]. At the same time national MMR was about 11.4 per 100, 000 live births and Mahasarakham Province was 32.76 per 100, 000 live births while Ministry of Public Health set national target of late antenatal care at < 40% and MMR < 18 per 100, 000 live births[28]. This showed that maternal and child health problem was not serious in the national level but still severe problem in Mahasarskham Province.

There were limited studies about it in Thailand. There is a need to do further research on late antenatal care for improvement our management about maternal and child health care. Reviews of the past literatures and implicated theories are very essential to define independent variables and develop conceptual frame work for the investigation. This helps to develop clear understanding of the present study, which can be formulated with appropriate research methodology according to the objectives of study.

Antenatal care is one of the health services for pregnant women. There are many reasons for them to decide starting antenatal care, depend on their individual behaviors. Health seeking behaviors were defined as utilization of the system or the process of illness response [53]. The underlying assumption is that behaviour is best understood in terms of an individual's perception of their social environment.

On the whole, health-seeking behavior models as applied to public health mostly serve as catalogues of relevant variables that need to be considered in research design, rather than as behavioral models themselves. The mainly statistical data obtained using these models permit the evaluation of the relative weight of different factors in health behavior (use of preventive or therapeutic measures, choice between different health resources, non-compliance with treatment, or the consequences of behavior for delayed care seeking). The principal objective is to identify problematic areas in order to intervene with specific health system strategies. [54]

Very frequently, investigators adapt the models to the peculiarities of their research field or study area, or fuse various models, with the main aim to increase the possible key factors rather than to achieve theoretical advancements. [54]

Theoretical Model

Andersen's model

In the late 1960's Andersen developed a behavioral model that provides measures of access to medical care. The purpose of this model is to discover conditions that either facilitate or impede utilization. It assumes that people's use of health services is dependent on their predisposing characteristics, enabling resources and their illness level.

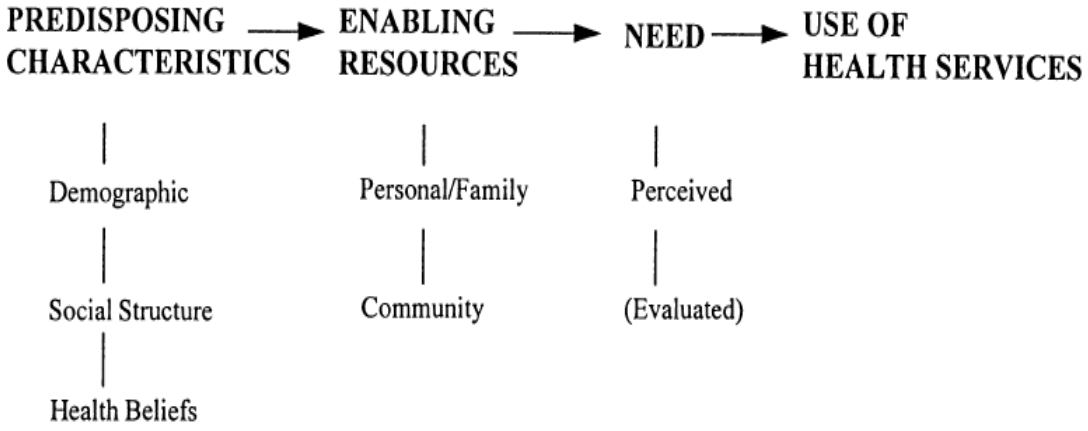

Figure 2.1 The Andersen's Behavioral Model of Health Services Utilization of 1960s. Source: Journal of health and social behavior 1995, Vol. 36 (March):1 – 10

Predisposing Factors: Some individuals have a propensity to use services more than other individuals, where propensity toward use can be predicted by individual characteristics which exist prior to the onset of specific episodes of illness. People with certain of these characteristics are more likely to use health services even though the characteristics are not directly responsible for health service use. Such characteristics include demographic, social structural and attitudinal-belief variables.

- Demographic: Age and gender, marital status and past illness
- Social Structure: Education, race, occupation, ethnicity, social networks, social interactions, and culture
- Health Beliefs: Attitudes, values, and knowledge that people have concerning and towards the health care system

Enabling resources: Even though individuals may be predisposed to use health services, some means must be available for them to do so. A condition which permits a family to act on a value or satisfy a need regarding health service use is defined as enabling. Enabling conditions make health service resources available to the individual. Enabling conditions can be measured by family resources such as income, level of health insurance coverage, or other source of third-party payment, whether or not the individual has a regular source of care, the nature of that regular source of care, and the accessibility of the source. Apart from family attributes, certain enabling characteristics of the community in which the family lives can also affect the use of services. One such characteristic is the amount of health facilities and personnel in a community. If resources are reasonably plentiful and can be used without queuing up, they might be used more frequently by the population. From the economic standpoint one might expect people experiencing low prices for medical care to use more services. Other measures of community resources include region of the country and the rural-urban nature of the community in which the family lives. These variables might be linked to utilization because of local norms concerning how medicine should be practiced or overriding community values which influence the behavior of the individual living in the community. [55]

- Personal/Family: The means and know how to access health services, income, health insurance, a regular source of care, travel, extent and quality of social relationships
- Community: Available health personnel and facilities, and waiting time, urban-rural character

Need: Need factors represent the most immediate causes of health service use. In addition to perception of illness by the individual or his family, a clinical evaluation is also included in the model since once the individual seeks care from the formal system the nature and extent of that care is in part determined by them. Measures of perceived illness include number of disability days that an individual experiences. Such days are those during which the individual is unable to do what he usually does be that work, go to school, take care of the house, or play with other children. Other measures of perceived illness include symptoms the individual experiences in a given time period and a self-report of general state of health, e.g.,

excellent, good, fair, or poor. Evaluated illness measures are attempts to get at the actual illness problem that the individual is experiencing and the clinically judged severity of that illness.

- Perceived: "How people view their own general health and functional state, as well as how they experience symptoms of illness, pain, and worries about their health and whether or not they judge their problems to be of sufficient importance and magnitude to seek professional help."
- Evaluated: "Represents professional judgment about people's health status and their need for medical care."[56]

Studies related to variables

Predisposing characteristic

"Using trust databases to identify predictors of late booking for antenatal care within the UK." was studied by Baker, E. C. and D. Rajasingam. The objective of this study is to identify predictors of late antenatal care using routinely collected data. They found that women aged between 15 and 19 years, women with more than four children, and women belonging to the ethnic group 'other' were all significantly more likely to book late. [30]

"Late entry to antenatal care in New South Wales, Australia" was studied by Lieu Thuy Thi Trinh and George Rubin. They defined variables as outcome variables and explanatory variables. Outcome variables composed of early and late antenatal care while explanatory variables reflect from Andersen's model composed of age, race, place of residents, number of previous pregnancies, last delivery by caesarean, baby sex, complication during current pregnancy, number of fetuses and number of cigarettes smoke per day. They found that the groups of women with highest risk were teenagers, migrants from developing countries, women living in Western Sydney, Aboriginal and Torres Strait Islanders, women with three or more previous pregnancies and heavy smokers. The high risk groups with largest number of women were migrants from developing countries and women living in Western Sydney. [31]

"Determinants of maternal health care utilization in Holeta town, central Ethiopia" was studied by Kidist Birmeta, et al in 2112. It published that there was a significant association between ANC attendance and some demographic, socio-economic and health related factors (age at last birth, literacy status of women, average monthly family income, media exposure, attitude towards pregnancy, knowledge on danger signs of pregnancy and presence of husband approval on ANC)[57].

"Late antenatal care booking and its predictors among pregnant women in South Western Nigeria" studied by Adekanle DA, Isawumi AI**.** Their variables composed of age, tribes, religion, educational status, employment status, husband's educational status, parity. They found that maternal education and age remained significant factors influencing late booking. [41]

"Factors associated with late booking for antenatal care in central Manchester." was studied by Chisholm, D. K. He found that the factors associated with late booking amongst the resident population of Central Manchester Health Authority. A cohort study was carried out to examine the factors associated with late booking amongst the resident population of Central Manchester Health Authority. The factors of importance were found to include teenage pregnancy, unemployment in the household, ethnic origin, moving during pregnancy, geographical area of residence and opinions about the value of antenatal care. Some reasons for delay in consulting doctors were identified, including uncertainty about the pregnancy and in some cases because it was unwelcome. Delays were also noted to occur in the health service referral system. [29]

"Utilization of antenatal services among adolescents in Western Uganda" was studied by Kasabiiti Jennifer Asiimwe. Demographic aspects of adolescents such as age, religion, parity, residence, education level, tribe, district of origin act through proximate factors; household, community, societal beliefs, program factors (availability of health structures, accessibility, acceptability, occupation, income levels, quality of health care, attitudes of service providers) impacted on the times an adolescent either visits a health centre or utilizes an antenatal care facility at least once. [58]

" Antenatal Care Adequacy In Three Province of Vietnam" published in 2006 reported that the women in the rural area attended ANC later, had fewer visits and received much fewer services than urban women. The large disparity in ANC adequacy between the two settings suggests special attention for the ANC program in rural areas focusing on its content. Revision and enforcement of the national guidelines to improve the behavior and practice of both users and providers are necessary [26].

"Factors affecting the utilization of antenatal care services in Ibadan, Nigeria" was studied by M.D Dairo, K.E. Owoyokun. Their variables were age, tribe, religion, education status, occupation, husband's occupation status, husband's education status, family type, location, parity, health decision. They found that women in urban areas were more than 2 times likely to attend antenatal clinic than women in rural areas. Women who were Muslims or other religions were more than 2 times likely to attend antenatal care clinic than women who were Christians. Women who were 25 years and older were more than 2 times more likely to utilize antenatal than women who were 25 years or younger. [33]

"The demographic characteristics of early and late attenders for antenatal care." was studied by Essex, C., A. M. Counsell, et al. in New Zealand. They found that late ANC respondents were also more likely to be unmarried, of lower socioeconomic status, young or with lower educational attainment. The reason for delayed antenatal care needs to be investigated and mothers who are high parity and non-European need to be particularly targeted to encourage them to attend for antenatal care early [13].

"*Late booking at the Michael Mapongwana antenatal clinic (ANC) in Khayelitsha*" was studied by Sybrand Johannes de Vaal. The objective of this qualitative study was to understand why women book late at this specific antenatal care. She found that majority were multigravid, unmarried and unemployed. A high incidence of previous or current obstetric problems was noted. Important personal barriers included ignorance of purpose of antenatal care, ignorance of ideal booking time, and denial or late recognition of an unplanned pregnancy. Provider barriers appeared to be significant, especially the cumbersome booking system, absence of an ultrasound service, and perceived poor quality of care [34].

"Assessment of the Content and Utilization of Antenatal Care Services in a Rural Community in Cameroon" was studied in Cameroon. It published that only 27.2% of women booked for ANC in the first trimester. Participant's educational level was a significant predictor of early booking for ANC [59].

"Socio Demographic Factors Determining the Adequacy of Antenatal Care among Pregnant Women Visiting Ekiti State Primary Health Centers" studied by Ajayi in Nigeria reported that occupation and level of education were determinants of whether or not the pregnant women made their first antenatal visits at the first trimester. More respondents who were not working and those who were unskilled workers made their first antenatal visit at the first trimester compared to those who were skilled workers; However age, marital status religion, parity, where else the respondents received care and location were not found to be significantly associated with early antenatal visits [60].

"Seeking early care: the role of prenatal care advocates." was studied by Winston, C. A. and K. S. Oths. The objective of this study was to investigate the role of social support in the initiation of prenatal care by analyzing data from interviews with 36 pregnant women at a public health facility in Tuscaloosa, Alabama. They found that after controlling for age and education, three variables were found to be associated with earlier estimated gestational age at the time of a woman's first prenatal visit: self-referral to care, more prenatal care advocates, and fewer children. There was no significant effect on the timing of entry to care associated with ethnicity, marital status, transportation availability, rural vs. urban residence, distance of residence from the clinic, or prior prenatal care at the public health facility. These results suggest that first-time mothers are likely to seek early care and that family and friends play a significant support role in encouraging women to begin care [47].

"Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania" was studied by Karin Gross et al. The variables composed of Socio-demographic characteristics (age, parity, marital status, history of abortion/stillbirth, education level, ethnicity), antenatal care knowledge and perception (perceived antenatal care starting time, knowledge of services, perceived service quality, perceived health worker attitudes, traditional medicine use), pregnancy perception (early recognition of pregnancy, waiting for quickening), social and

economic support (money, advice received to attend antenatal care, accompanied to clinic, supported by husband). They found that perceived poor quality of care, late recognition of pregnancy and not being supported by the husband or partner were identified as factors associated with a later antenatal care enrolment. Primiparity and previous experience of a miscarriage or stillbirth were associated with an earlier antenatal care attendance. Adolescent pregnant women started antenatal care no later than adult pregnant women despite being more likely to be single. [36]

"Why do women seek antenatal care late? Perspectives from rural South Africa." was studied by Myer, L. and A. Harrison. The objective of this study was to document perceptions of health and health care during pregnancy and investigated factors shaping the utilization of antenatal care. They found that most women in this setting do not perceive significant health threats during pregnancy, and in turn view more than one antenatal care visit as unnecessary. In contrast, women perceive labour and delivery as a time of significant health risks that require biomedical attention, and most women prefer to give birth in a health facility. [42]

"Early prenatal care in urban black and white women." was studied by Petitti, D., C. Coleman, et al. Alameda County, California, in 1987.

The objective of this study was to identify potentially modifiable factors associated with the start of care as well as the groups in which it is most likely to be late. It showed that variables related to insurance coverage and financial status showed the greatest difference between early and late attenders at prenatal care in both groups. At virtually every level of almost every variable studied, black women were less likely than white women to begin prenatal care in the first trimester. The data suggested that some of the difference in the timing of prenatal care may be due to lack of awareness of, or failure to pay attention to, the signs of early pregnancy. [40]

"Reducing delay in booking for antenatal care" was studied by Robson, J., K. Boomla, et al. in London. They found that there was no improvement in delay in booking owing to late confirmation of pregnancy. The benefits of this scheme were due to improved attendance and reduced delays in booking among women who confirmed pregnancy before 16 weeks gestation. [51]

"Early versus late prenatal care in New Mexico: barriers and motivators." was studied by Rogers, C. and M. Schiff. The objective of this study was

to investigate barriers and motivators for women receiving early versus late prenatal care. They found that ethnicity, education, income, and age did not predict initiation of prenatal care. Not being aware of the pregnancy (15%), and dislike of going to doctors (14%) as reasons for the delay in seeking prenatal care. Over two-thirds of the pregnancies were unplanned, but 82 percent of the women felt positive about the pregnancy. [49]

"Why do women attend late for antenatal booking? A qualitative interview study exploring the perspectives of service users and stakeholders" was studied by GL Jones, et al. This study explored the reasons why women book late from (1) the perspectives of pregnant women who booked after 19 weeks gestation and (2) key maternity stakeholders involved in the care of antenatal women. They identified service user and healthcare factors which delay access to antenatal care, including delayed diagnosis of pregnancy, poor reproductive health knowledge, contraceptive failure, lack of lay facilitation of engagement with antenatal care, and individual socio-cultural risk factors. These factors should be considered by service commissioners and health and social care practitioners in order to promote the provision of timely antenatal care for all women. [45]

"Association between early prenatal care and mother's intention of and desire for the pregnancy." was studied by Hulsey, T. M. The objective of this study was to examine the associations between having planned to become pregnant and valuing an unintended pregnancy with seeking early prenatal care. He found that unwanted pregnancy was found to be a predictor of late/no prenatal care. Black ethnicity also was found to be a predictor of late/no prenatal care.[48]

"Pregnancy wantedness and the early initiation of prenatal care." was studied by Joyce, T. J. and M. Grossman. The study examined the impact of the wantedness of a pregnancy on the demand for early prenatal care. Using a cohort of pregnant women in New York City, they estimated a prenatal care demand function in which they controlled for the probability of giving birth, given a woman is pregnant. They interpreted this control as a measure of wantedness. The results indicated that if the black and Hispanic women who aborted had instead given birth, they would have delayed the initiation of prenatal care, on average, more than three-quarters of a month longer than the mean number of months of delay that were actually observed for the

women who gave birth. By allowing women to terminate an unwanted pregnancy, induced abortion increased the average use of prenatal care among black and Hispanic women relative to what would have been observed if the women who aborted had instead given birth. [50]

"Factors Associated with late Antenatal Care Attendance in Selected Rural and Urban Communities of the Copperbelt Province of Zambia" was studied by Isaac Banda, et al in 2012. It published that late antenatal care attendance remains high in both rural and urban districts indicating the need for intensified and more focused utilization of resources aimed at increasing sensitization of the importance of early attendance for high risk groups, such as women with unplanned pregnancies, inadequate knowledge about ANC, cultural beliefs and women who are multiparous [61]

"Timing and reasons for coming late for the first antenatal care visit by pregnant women at Mulago hospital, Kampala Uganda." was studied by Kisuule, I., D. K. Kaye, et al. The objectives were to determine the gestation age at which pregnant women make their first antenatal care visit and the reasons for late coming. They found that pregnant women who come late for antenatal care in Mulago hospital, Uganda were not well-informed about the right gestation age at which they should make their first antenatal care visit and/or of the importance of early attendance at antenatal care. [43]

"Use of a community mobile health van to increase early access to prenatal care." was studied by Edgerley, L. P., Y. Y. El-Sayed, et al. in USA. They found that women who initiated prenatal care on the Women's Health Van achieved earlier access to prenatal care when compared to women initiating care at other community health clinics. [46]

"Reasons given by pregnant women for late initiation of antenatal care in Niger Delta, Nigeria" was studied by E. P. Ndidi and I. G. Oseremen. Their variables were age, parity, social class, marital status and marital setting. The findings of this study suggested that most women book late because of a belief that there were no advantages in booking for antenatal care in the first three months of pregnancy. [62]

"Explaining ethnic differences in late antenatal care entry by predisposing, enabling and need factors in The Netherlands. The Generation R Study."

studied by Chote, A. A., G. T. Koopmans, et al. The objective of this study was to investigate how ethnic differences between Dutch and non-Dutch women with respect to late entry into antenatal care provided by community midwifes could be explained by need, predisposing and enabling factors. They found that the percentage of mothers entering antenatal care late was higher in all non-Dutch compared to Dutch mothers. [37]

"Late start of antenatal care among ethnic minorities in a large cohort of pregnant women." was studied by Alderliesten, M. E., T. G. Vrijkotte, et al. The objectives of this study were to investigate the difference in timing of the first antenatal visit between ethnic groups and to explore the contribution of several noneconomic risk factors. They found that all non-Dutch ethnic groups were significantly later in starting antenatal care during the whole duration of pregnancy compared with the ethnic Dutch group. These differences disappeared almost totally in the non-Dutch-speaking ethnic groups when the following risk factors were added to the model: poor language proficiency, low maternal education, teenage pregnancy, multiparity and unplanned pregnancy. The differences remained in the Dutch-speaking ethnic groups. [38]

"Increasing access to prenatal care: an evaluation of minority health coalitions' early pregnancy project." was studied by Jewell, N. A. and K. M. Russell in Indiana USA . Early prenatal care utilization was a problem for racial and ethnic minority women in Indiana. Minority health coalitions in Indiana developed early pregnancy care coordination projects to address this need. The objective of this study was to evaluate project outcomes, birth certificates of infants born to project mothers were matched with birth certificates of infants whose mothers did not receive care coordination. Results showed that project mothers were significantly more likely to start prenatal care earlier, had better prenatal care utilization. [39]

Enabling resources

“Factors associated with antenatal care utilization among rural women in Lao People's Democratic Republic.” was published in 2011. It reported a quantitative, cross-sectional interview study that was conducted in the Khammouane and Champasack provinces. The study population comprised all currently pregnant women

15-45 years of age with a gestational period beyond 32 weeks plus all women who had given birth during the last 12 months. With the informed consent of all eligible women, 460 respondents were included in the study and interviewed using a structured questionnaire. Multiple logistic regression analysis was applied to determine factors significantly related to ANC use. Fifty-one percent of the respondents had at least one ANC visit. Among the users, 63% had visited ANC three times or more but only 28% attended during the first trimester. After adjusting for other factors, using a 95% Confidence Interval (CI), statistically significant associations were found between ANC use and the following factors: women whose husbands were salaried employees (OR=2.66, CI=1.45-4.88); women younger than 18 years old at first pregnancy (OR 0.56, CI=0.28-0.97); women perceiving ANC as somewhat useful (OR=2.88, CI=1.26-6.61) or very useful (OR=7.45, CI=3.59-15.46). Awareness of the usefulness of ANC was related to more frequent use and could be one focus of community intervention to increase utilization [25].

"Utilization of antenatal care services among teenagers in Ethiopia: A cross sectional study" studied by Tewodros Alemayehu, Jemal Haidar, Dereje Habte. Their variables were age at birth, religion, setting, marital status, education, wealth index, occupation. The major deriving factors for the utilization of antenatal care service were education level of women and their male partners, better wealth index and urban residence. [32]

"Why do women not use antenatal services in Low- and Middle-Income Countries?" was studied by Finlayson K, Downe S. The researchers identified three main themes. The first theme reflects women's views that pregnancy is a healthy state and so saw little reason to visit health professionals when they perceived no risk to their well-being—the researchers called this theme, "pregnancy as socially contingent and physiologically healthy." The second theme relates to women's limited financial resources, so that even when antenatal care was offered free of charge, the cost of transport to get there, the loss of earnings associated with the visit, and the possibility of having to pay for medicines meant that women were unable to attend—the researchers called this theme "resource use and survival in conditions of extreme poverty." The third theme the researchers identified related to women's views that the antenatal services were inadequate and that the benefits of attending did not outweigh

any potential harms. For example, pregnant women who initially recognized the benefits of antenatal care were often disappointed by the lack of resources they found when they got there and, consequently, decided not to return. The researchers called this theme “not getting it right the first time.” These findings suggested that there may be a misalignment between the principles that underpin the provision of antenatal care and the beliefs and socio-economic contexts of pregnant women in LMICs, meaning that even high-quality antenatal care may not be used by some pregnant women unless their views and concerns were addressed. [44]

Needs

"Clinical, provider and sociodemographic predictors of late initiation of antenatal care in England and Wales." was studied by Kupek, E., S. Petrou, et al. The objective of this study was to identify factors that are predictive of late initiation of antenatal care in England and Wales. They found that primiparous women of high obstetric risk were more likely to initiate antenatal care after 10 weeks of gestation than a low risk reference group. This association between high obstetric risk status and late initiation of antenatal care was not replicated among multiparous women. [35]

Summary

From literature review about starting antenatal care, we found that many studies were done in the developing countries which the maternal and child health problems are severe and they concerned variables about demographic and socioeconomic factors. While in developed countries, their studies emphasized in ethnic minority groups. In Mahasarakham province there was not problems of ethnic minority and religion before so this study we concerned variables liked other developing countries.

CHAPTER III
RESEARCH METHODOLOGY

3.1. Study design

This is a cross-sectional study to explore the health seeking behavior of postpartum women in starting ANC and the factors affecting on decision to start ANC in Mahasarakham province in Thailand. Mahasarakham province has 13 districts and 11 hospitals (10 in rural area and 1 in urban area). In 2011, total mothers in Mahasarakham province delivered in the hospitals were 6,125 cases and mothers started ANC within 12 weeks gestational age were 2,007 cases (32.77%)[27]

3.2. Study population and study sites

The study populations were postpartum women who delivered in all hospitals in Mahasarakham province.

Criteria for selection of study group

Inclusion criteria:

1. All Thai postpartum women delivered in Mahasarakham province who started antenatal care in anywhere of Thailand.

2. Postpartum women who willing to participate

3. Postpartum women who had ability to communicate

Exclusion criteria: All minority ethnic postpartum women

3.3. Sample size

From Krejcie & Morgan formula

Estimate sample size, n

$$n = \frac{Z^2 NP(1-P)}{Z^2 P(1-P) + (N-1)d^2}$$

n = required sample size.

z = standard normal score at 95% of confidence interval = 1.96

N = the population size = 6125.

P = the population proportion (assumed to be 0.67).

d = the degree of accuracy expressed as a proportion or acceptable error =.04.

$$n = \frac{(1.96^2)(6125)(0.67)(1-0.67)}{1.96^2(0.67)(1-0.67)+(6125-1)(.04)^2}$$

n = 5,202.44/10.647 = **488.63**

The sample size was increased by 10% to allow for any incomplete data occurring during data collection. Consequently, the required sample size was at least **537.**

3.4. Sampling technique

This research was studied all postpartum women in Mahasarakham province so stratified sampling with proportional to size was used to select subjects. The sample was collected from postpartum ward of all hospitals in Mahasarakham province. There were total 11 hospitals available for data collection. For 537 cases from calculated sample size, they were shared to each hospital for data collection based on number of delivery in 2011. (Table 3.1)

Table 3.1 Number of sample sizes in each hospital

Hospital	Delivery cases in 2011	Sample case
Mahasarakham	3,428	300
Kaedam	73	7
Kantarawichai	158	14
Nadoon	151	13
Nacherk	272	24
Borabue	755	66
Payakhaphumpisai	71	6
Kosumpisai	514	45
Chiangyuen	256	22
Wapipathum	384	34
Yangseesurat	63	6
Total	6,125	**537**

3.5. Research instruments

The structured questionnaire regarding study variables were used for this survey. A self-administered questionnaire consisted of two parts: answers from postpartum women and data from maternal and child health handbooks.

The methods to collect the data were interview by using self questionnaires and records from maternal and child health handbooks filled by coordinators.

3.6. Test for validity and reliability

Test for content validity

Questionnaires were sent to two experts to examine the correct, validity, and language clearness. The validity of the questionnaire was checked by experts at Mahidol University and experts working in the related fields at the district.

3.7. Data collection procedure

The research proposal was submitted to the Ethics Committee of Mahasarakham Provincial Health Office and contact the study site to obtain permission to conduct the study. After permission, the study was started in 1 June 2014.

11 coordinators from 11 hospitals were trained about the questionnaires and how to complete the questionnaires. The questionnaires were distributed to all hospitals based on ratio of sample sizes. The data was collected from postpartum woman who would be discharge from a hospital the day after by self questionnaire and a coordinator would completed it by filling with records in maternal and child health handbook later. Every postpartum woman in all hospitals, who was not in exclusion criteria, was interviewed until all of the questionnaires were used up. All questionnaires were returned to principal researcher in 15 December 2014.

During study, the principal researcher supervised randomly the study sites to check the data collection progress and identified any problems as well as possible solutions.

3.8. Data Analysis

The data collectors checked completeness of questionnaire and internal consistency of data in the questionnaire. The data was coded and analyzed after the study by using SPSS version 16. The chi-square test was used to determine association between each independent variable and dependent variable. A multiple logistic regression was performed to examine associations between independent variables and dependent variable, which the significant level was set at 0.05.

3.9. Ethical consideration

The research protocol was approved by the Ethics Committee of Mahasarakham Provincial Health Office, and the chief directors of all hospitals in Mahasarakham province. Before starting interview, the consents were obtained from the postpartum women with the explanation of objectives of this study, profits for future intervention, secret of the data and freedom of decision to withdraw the participation in the study during interview process at anytime. After permission, coding system was used to identify the respondent instead of name and surname. Finally, the data collector thanked the postpartum mother for the participation in the study.

CHAPTER IV
RESULTS

The aim of this research was to determine the factors affected the time to start antenatal care of postpartum women in Mahasarakham Province and the prevalence of quality antenatal cares in Mahasarakham Province. A total of 537 questionnaires were distributed to every hospital but completed and returned from all hospitals 518 questionnaires, response rate 96.5 %.

This was a cross - sectional study. The results are presented in the form of number and percentage. The quantitative data is shown with mean, SD, minimum and maximum. Chi – square tests and multiple logistic regressions were used to examine the associations between the independent variables and dependent variable. The research results are presented as follows.

4.1 Predisposing characteristics

Table 2 below shows data about predisposing characteristics of the postpartum women. The mean age was 25.3 years old; most of postpartum women were young adult group (20-29 years old). 18.6 % of them were teenage pregnancies and 3 cases were girl-mom. Most were coupled (90.5%), multigravida pregnancies (56.6%), high educated (Upper secondary and above) (55%), employed (58.9%), lived in rural area (76.4%) and had Universal Coverage (UC) health insurances (66%).

With regard to beliefs; the recognition of their pregnancies mostly was within 12 weeks of gestational age (75.9%). Awareness of birth control was about 58.3%, and awareness of ANC starting time was only 6.6% of the postpartum women. Majority of them were planned pregnancies, only 11.8% were unplanned.

Table 4.1 Number and percentage of postpartum women by predisposing characteristics

Demographic	Number	Percent
Age group	**518**	
< 15 yrs.	3	0.6
15-19 yrs.	93	18.0
20-29 yrs.	291	56.2
30-39 yrs.	121	23.4
> 40 yrs.	10	1.9
mean = 25.3 yrs, SD=6.1yrs , min = 14 yrs, max = 44 yrs		
Marital status group	**518**	
coupled	469	90.5
singled	49	9.5
Gravidity	**518**	
primigravida	223	43.4
multigravida	291	56.6
Social structures		
Education groups	**518**	
Upper secondary and above	285	55.0
Lower secondary and below	233	45.0
Social structures		
Occupation groups	**518**	
employed	305	58.9
unemployed	213	41.1
Place of resident	**518**	
Urban	122	23.6
Rural	396	76.4
Health insurance groups	**518**	
Non UC	176	34.0
UC	342	66.0
Beliefs		
Pregnancy recognition	**518**	
≤12 wks.	393	75.9
>.12 wks	125	24.1
Awareness of birth control	**439**	
Yes	302	58.3
No	137	26.4

Table 4.1 Number and percentage of postpartum women by predisposing characteristics (cont.)

Beliefs	Number	Percent
Pregnancy planning	**518**	
planned	457	88.2
unplanned	61	11.8
Awareness of ANC starting time	**518**	
Yes	34	6.6
No	494	93.4

4.2 Enabling resources

Table 3 below shows frequencies of enabling resources of the postpartum women. Regarding family factors, most of them were nuclear families (55.8%). About their husbands, median age was 28.4 years old and most of them were in young adult group (20-29 years old). Their most education levels were upper secondary and above (55 %) and almost of them were employed (91.2 %). Advisors for most postpartum women to start ANC were their husbands (46.7%).

Regarding community factors, most postpartum women had good opinion on nearby health service units (94.8%) and utilized them (83.0%).

Table 4.2 Number and percentage of postpartum women by enabling resources

Family	Number	Percent
Family type	**430**	
Nuclear family	240	55.8
Joint family	190	44.2
Husband age	**480**	
< 20 yrs.	33	6.9
20-29 yrs	255	53.1
30-39 yrs	159	33.1
≥ 40 yrs	33	6.9
Mean = 28.4 yrs, SD = 6.7 yrs., min = 15 yrs, max =57 yrs		
Husband education	**511**	
Upper secondary and above	281	55.0
Lower secondary and below	230	45.0

Table 3 Number and percentage of postpartum women by enabling resources.(cont.)

Family	Number	Percent
Husband occupation	**511**	
Employed	466	91.2
Unemployed	45	8.8
Advisor to ANC	**518**	
Husband	242	46.7
Parents	164	31.7
None	112	21.6
Opinion on nearby health service unit	**517**	
Good	491	95.0
Bad	26	5.0
Nearby health service utilization	516	
Yes	430	83.3
No	86	16.7

4.3 Needs

Table 4.3 shows data about needs of the postpartum women**.** Minority of them had disability symptoms (1.4%), history of abortion (14.3%) and history of abnormal labour (8.1%).

Table 4.3 Number and percentage of postpartum women by **needs.**

Needs	Numbers	Percents
Disability symptoms	**518**	
Yes	7	1.4
No	511	98.6
History of abortion	**518**	
Yes	74	14.3
No	444	85.7
History of abnormal delivery	**518**	
Yes	42	8.1
No	476	91.9

4.4 Time to start antenatal care

The result of dependent variables in this study is shown in table 4.4. The postpartum women took at least 1 visit ANC before delivered 99.6%, at least 4 visits 94 % at least 5 visits 89.2%, delivered without any ANC 2 cases (0.4%), started ANC within 12 weeks gestational age are 50.4% and took good quality of ANC 48.5%. (Good quality ANC is the ANC start within 12 weeks gestational age and more than 4 visits)

Table 4.4 Number and percentage of time to start antenatal care.

ANC	Number	Percent
Times	**518**	
0	2	.4
1	5	1.0
2	10	1.9
3	14	2.7
4	25	4.8
> 5	462	89.2
Mean = 8.6 times, SD = 3.4 times, min = 0 time, max = 24 times		
Early or late	**518**	
Early (≤ 12 wks GA)	261	50.4
Late (> 12 wks GA)	257	49.6

4.5 Association between independent and dependent variables

4.5.1 Association between predisposing characteristics and time to start ANC

Table 4.5 describes the relationship between predisposing characteristics and time to start ANC. There was a significant association between age (P-value < 0.001), education (P-value = 0.001), occupation (P-value < 0.001), health insurance (P-value < 0.001), pregnancy recognition (P-value < 0.001), awareness of birth control (P-value = 0.029), and pregnancy planning (P-value = 0.009) with time to start ANC.

Teen age pregnancies were about 3.84 times (95% CI 2.33-6.34) more likely to start ANC late than adults. Low educated (lower secondary and below) postpartum women were 1.84 times (95% CI 1.30-2.61) more likely to start ANC late than high educated (upper secondary and above). Unemployed postpartum women were 1.92 times (95% CI 1.35-2.74) more likely to start ANC late than employed.

UC- righted postpartum women were 2.35 times (95% CI 1.61-3.42) higher to start ANC late than non-UC-righted. Late recognition of their pregnancy

made 57.16 times (95% CI 20.67-158.13) more likely to start ANC late than early recognition. No awareness birth control and unplanned pregnancies were 1.51 (95% CI 1.04-2.19) and 2.11 (95% CI 1.20-3.69) times more likely to lately attend than other groups.

There was no significant association between time to start ANC with marital status, gravidity of pregnancy, place of resident and awareness of ANC starting time.

Table 4.5 Association between predisposing characteristics and time to start ANC

Predisposing characteristics	Time to start ANC				
	n	Late %	Early %	Crude OR (95% CI)	P-value
Age group					
Teen age	96	75.0	25.0	3.84(2.33-6.34)	< **0.001**
adult	422	43.8	56.2	1	
Marital status					
Single	49	59.2	40.8	1.53 (0.84-2.79)	0.161
Coupled	469	48.6	51.4	1	
Gravidity group					
Primigravida	224	52.7	47.3	1.24(0.88-1.76)	0.224
Multigravida	294	47.3	52.7	1	
Education level					
Low	233	57.9	42.1	1.84(1.30-2.61)	**0.001**
High	285	42.8	57.2	1	
Occupation					
Unemployed	213	59.2	40.8	1.92(1.35-2.74)	< **0.001**
Employed	305	43.0	57.0	1	
Place of resident					
Rural	396	47.5	52.5	1.46(1.01-2.12)	0.080
Urban	122	56.6	43.4	1	
Health insurance					
UC	342	56.7	43.3	2.35(1.61-3.42)	< **0.001**
Non-UC	176	35.8	64.2	1	

Table 4.5 Association between predisposing characteristics and time to start ANC (cont.)

Predisposing characteristics	n	Time to start ANC			
		Late %	Early %	Crude OR (95% CI)	P-value
Pregnancy recognition					
>12 wks.	125	96.8	3.2	57.16(20.67-158.13)	**< 0.001**
≤.12 wks	393	34.6	65.4	1	
Awareness of birth control					
No	168	56.5	43.5	1.51(1.04-2.19)	**0.029**
Yes	350	46.3	53.7	1	
Pregnancy planning					
Unplanned	61	65.6	34.4	2.11(1.20-3.69)	**0.009**
Planned	457	47.5	52.5	1	
Awareness of ANC starting time					
No	484	49.4	50.6	0.87(0.43-1.84)	0.688
Yes	34	52.9	47.1	1	

4.5.2 Association between enabling resources and time to start ANC

Table 4.6 shows that husband age (P-value<0.001), husband education (P-value=0.033), adviser to ANC (P-value=0.016) were associated with time to start ANC. But family type and husband occupation were not.

Teen age husband was 6.55 times (95% CI 2.49-17.28) more likely to start ANC late than adult. Low education (lower secondary and below) of husband was 1.46 times (95% CI 1.03-2.08) higher than high education (upper secondary and above). And postpartum woman advised to ANC by her parent was 1.82 times (95% CI 1.12-2.96) more likely to start ANC late than who decided by herself.

There was no significant association between opinion on nearby health service unit, nearby health service unit utilization and time to start ANC. Although attitudes of almost postpartum women about it were good and they utilized their services but there was no significant effect on time to start antenatal care.

Table 4.6 Association between enabling resources and time to start ANC.

Enabling Resources	Time to start ANC				
	n	Late %	Early %	Crude OR (95% CI)	P-value
Family type					
Nuclear family	240	45.4	54.6	0.86(0.59-1.26)	0.433
Joint family	190	48.9	51.1	1	
Husband age					
Teen age	49	84.8	15.2	6.55 (2.49-17.28)	**< .001**
adult	469	46.1	53.9	1	
Husband education level					
Low	285	54.3	45.7	1.46(1.03-2.08)	**0.033**
High	233	44.8	55.2	1	
Husband occupation					
Unemployed	45	60.9	39.1	1.68(0.91-3.12)	0.100
Employed	466	48.1	51.9	1	
Adviser to ANC					
Husband	242	44.2	55.8	0.95(0.60-1.49)	0.816
Mother	164	60.4	39.6	1.82(1.12-2.96)	**0.016**
No	112	45.5	54.5	1	
Opinion on nearby health service unit					
Bad	26	38.5	61.5	0.62(0.28-1.40)	0.622
Good	491	50.1	49.9	1	
Nearby health service utilization					
No	86	53.5	46.5	1.20(0.78-1.92)	0.432
Yes	432				

4.5.3 Association between needs and time to start ANC

Table 4.7 shows the relationship between needs and time to start ANC. Postpartum woman without history of abortion was 1.64 times (CI 0.99-2.71more likely to start ANC late than other but history of abnormal labour was no significant association. Disability symptom was not mentioned as it was very small numbers and had blank data, although it showed that all of postpartum women who had disability symptom started antenatal care early.

Table 4.7 Association between needs and time to start ANC

Needs	Time to start ANC				
	n	Late (%)	Early (%)	Crude OR (95% CI)	P-value
Disability symptom					
No	511	49.7	50.3	1.635E9(.000)	.999
Yes	7	100	0		
History of abortion					
No	444	51.4	48.6	1.64(0.99-2.71)	**0.054**
Yes	74	39.2	60.8	1	
History of abnormal delivery					
No	476	50.0	50.0	1.21(0.64-2.28)	0.555
Yes	42	45.2	54.8	1	

4.5.4 Association between independent variables and time to start ANC

All significant independent variables that had a relationship with time to start ANC in the Chi-square tests were included in the full model. Except pregnancy recognition because of too little numbers of data and very wide range of confidential interval. And it was added history of abortion variable in the table due to be much closed to significant. (Table 9)

After adjusted, data shows significant association only 2 variables; teenage pregnancy (P-value = 0.004) and UC-righted health insurance (P-value < 0.013). Teenage pregnancy was 2.39 times (AOR=2.39, 95% CI 1.05-4.13) more likely to start ANC late than adult and UC-righted health insurance was 1.66 (AOR=1.66, 95% CI 17.71-137.92) times higher to start ANC late non-UC-righted health insurance.

Table 4.8 Full model of multiple logistic regression

Variables	Adj. OR	95% C.I.for OR		P-value
		Lower	Upper	
Age				
Teen age	2.39	1.32	4.34	**0.004**
Non teen age	1			
Education				
Low	1.27	0.83	1.94	0.282
High	1			
Occupation				
Unemployed	1.31	0.87	1.97	0.204
Employed	1			
Health insurance				
UC	1.66	1.11	2.49	**0.013**
Non UC	1			
Awareness of birth control				
No	1.28	0.84	1.95	0.259
Yes	1			
Pregnancy planning				
Unplanned	1.24	0.63	2.43	0.534
Planned	1			
Husband age				
Teen age	2,84	0.97	8.33	0.057
Non teen age	1			
Husband education				
Low	1.38	0.94	2.03	0.101
High	1			
Advisors to ANC				
Husband	0.80	0.49	1.31	0.380
Parents	1.05	0.58	1.76	0.986
None	1			
History of abortion				
No	1.42	0.83	2.42	0.198
Yes	1			

CHAPTER V
DISCUSSION

This cross sectional study was conducted at the hospitals in Mahasarakham Province in Thailand using self - administered questionnaires and data in maternal and child health handbooks. The aim of this study was to describe the prevalence of early and late ANC among post partum women in the hospitals, and to examine the relationship between time to start ANC of them and the following independent variables: predisposing characteristic, enabling resources and needs. 518 from 537 questionnaires were completed and returned. The response rate was 96.5 %.

5.1 Prevalence of late ANC

99.6% of post partum women in Mahasarakham Province got at least 1 ANC visit before delivered (99.1 % in 2009) [62], 94.0% got at least 4 visits and 89.2 % got at least 5 visits. With regard to the prevalence of late ANC among post partum women in this study, it showed that late ANC was about 49.6%. This result was lower than late ANC reporting only 66.3% in previous report in 2011 [27]. Compared other reports, Bangkruai hospital, Nonthaburi Province reported 57.1% of late ANC in 2013 [63]. Martin JA et al report 72.8% of women received the first antenatal care visit lately in Bangladesh, 41.5% in Egypt and 92.9.1 % in Rwanda[64]. Contrasted with USA, percentage of births to mothers who received first-trimester antenatal care was 73.7% [65]. This showed that more developing countries may influence more early ANC. On the other hand, it must be due to multifactorial such as economy, education system, health service system, etc.

5.2 Considered variables and time to start ANC

At start, this study considered many variables by "Andersen's behavior model of health services utilization" concept and previous studies. Twenty–one variables that might be significant effects to the study were selected.

About age, this study found that postpartum women in teenagers were more likely to start ANC lately than adult and was significantly associated (p-value = 0.004). A study in Australia (2004) found that teenagers were 2.99 times (CI 2.76-3.23, p-value < 0.001) more likely lately attend than thirty's [31]. Liked many previous studies in United Kingdom, New Zealand, Nigeria and WHO; they found significant association between teenage pregnancy and late ANC. [13, 30, 41, 66] A previous study found that teenagers did not often utilize health services [67]. Teenagers were more socially forced than adults from seeking timely and appropriate care, irrespective of whether the pregnancy occurs with or without marriage. [68] In developing countries where utilizing antenatal care was often limited, the level of utilization of services by teenagers might be even lower [69]. In fact, a large proportion of teenagers in developing countries received no antenatal care [70]. The reasons for delay in receiving care earlier in teenage pregnancy were inability to recognize signs of pregnancy [71], unwillingness to believe or admit they were pregnant [72], unavailability and inaccessibility of services [73- 76], and coercion and violence during pregnancy [77, 78]. Delay in entry into antenatal care could also reflect an unwillingness to continue with pregnancy [79].

In this study, comparing to adults (table Appendix C), teenagers started ANC early only 25 % of them contrast with 56.2% in adults. Their marital status was single 17.7%, coupled 82.3% and more likely to be single than adults 2.63 times (CI 1.39-4.95, p-value = 0.003). Their education was low level 70.8%, high level 29.2% and more likely to be low education level than adults 3.78 times (CI 2.34-6.12, p-value < 0.001). Their occupation was unemployed 75.0%, employed 25.0% and more likely to be unemployed than adults 5.98 times (CI 3.61-9.90, p-value < 0.001). Their gravidity was primigravidity 85.4%, multigravidity 14.6% and more likely to be primigravidity than adults 11.55 times (CI 6.33-21.08, p-value = 0.000). Their health insure was UC 90.6%, non-UC 9.4% and more likely to UC than adults 6.33 times (CI 3.10-12.92, p-value < 0.001). Their pregnancies were unplanned 28.1%, planned

81.9% and more likely to be unplanned than adults 4.47 times (CI 2.53-7.87, p-value < 0.001). No awareness of birth control was 58.3%, and more likely to not aware of birth control than adults 3.88 times (CI 2.45-6.14, p-value < 0.001). Their pregnancy recognition was late 43.8%, early 56.2% and more likely to be late than adults 3.18 times (CI 1.99-5.08, p-value = < 0.001). Their husbands' age were teenage 90.9%, adult 9.1% and more likely to be teenage than adults 71.27 times (CI 21.04-221.39, p-value < 0.001). These were similar to previous research studied by Sirikul Isaranurug, et al.[82]

Marital status in this study showed that single was more likely to start ANC lately than couple 1.53 times (CI 0.84-2.79) but no statistic significant (p-value=0.161). Liked study by Karin gross et al. in Tanzania that there was no significant relation between marital status and timing of pregnant women's first ANC visit [36].

Study in Zambia established that there was a tendency of initiating ANC late amongst women of gravidity in both rural and urban communities. [61] In Tanzania, being the first pregnancy was strongly associated with an earlier first ANC visit [36]. But it did not show significant association between gravidity and time to start ANC (OR =1.24, CI 0.88-1.76, p-value = 0.224) in this study.

With regard to education, the Oklahoma Pregnancy Risk Assessment Monitoring system (PRAMS) reported that mothers with less education were less likely to receive first trimester ANC [80]. Study in South western Nigeria [21] and Lao PDR [81] showed significant association between education level and first time ANC. In this study, after estimated through binary logistic regression analysis it showed significant association of them (OR=1.84, CI 1.30-2.61, p-value= 0.001). But after adjusting confounding factors it did not find significant relation of them (AOR= 1.27, CI 0.83-1.94, p-value= 0.282), liked the study in Ghana [68]. It might be possible that quality of the national education system of Thailand was not good enough and should receive more development.

Study in Nigeria found that respondents with working were less likely to start ANC visit than those not working [60]. They might be too busy and uncomfortable to take the health services in proper time. However there was not

significant association between the variables in this study when adjusting confounding factor was done (AOR= 1.27, CI 0.87-1.97, p=value = 0.204).

Studies in Ghanaian women and Vietnam found that urban residency was more likely to start ANC early than rural residency [26, 68]. But this study did not show significant association of them (OR=1.46, 95% CI 1.01-2.12, p=value = 0.080). This might be possible that easiness of access and quality of health services between rural and urban area were not different too much in Mahasarakham Province. Every sub district had sub district hospital and some sub districts had more than one hospital. People could utilize any nearby health service easily. Furthermore about specialist doctor, there were obstetricians not only in urban but also in some rural areas. The data in this study also showed that almost respondents believed in quality of nearby health service units (94.8%) and utilized them too. However, no significant association with time to start ANC was found.

Study in Alameda County, California showed that variables related to insurance coverage and financial status showed the greatest difference between early and late attenders at prenatal care in both black and white women [40]. Liked this study, it showed significant association (AOR= 1.66, CI 1.11-2.49, p-value = 0.013). UC-righted health insurance was 1.66 (AOR=1.66, 95% CI 17.71-137.92) times higher to start ANC late non-UC-righted health insurance. This might be possible that UC health insurance postpartum women might be unemployed, no exact jobs and became to daily workers which had no permission to leave for utilizing ANC. OR some became to migrant workers which must migrate from their home to hardly communicated places such as sugarcane farms, cassava farms. Moreover, this might due to “Health Card for Mother & Child” project of the Ministry of Public Health which was announced in 2013 for National Mother Day cerebration [83]. All Thai pregnant women can utilize ANC services from government health service units everywhere in Thailand without charges. This differed from the past that any pregnant women must receive the services from their registered units only, if they did not they must pay. So, especially in Social Security Scheme righted pregnant women, they were comfortably to access ANC from government health service units whether anywhere.

With regard to pregnancy recognition, study in Tanzania [36] presented that women's late recognition of pregnancy was associated with late ANC (p-value=0.002). This study firstly found significant association between them (OR= 57.16, 95% CI 20.67-158.13, p-value< 0.001). It showed that 24.1 % of the postpartum women recognized their pregnancy lately. This might be due to continued bleeding after pregnant, uncertain menstruation cycle, inability to recognize signs of pregnancy [71] or unwillingness to admit they were pregnant [72], so they delayed to initiate ANC. It might be possible that if we made them earlier recognition or perception of their pregnancies, it might influence more early antenatal care prevalence finally. In full model of multiple logistic regression, this variable did not added in the table because of too little number of data and very wide range of 95% CI.

Concerned about awareness of birth control, this study did not find significant association with time to start ANC after adjusting confounding factors (AOR=1.2 CI 0.84-1.95, p-value=0.259). Although a study in UK established that contraceptive failure delayed access to ANC.[30]

Study in Zambia [61] found that women who fell pregnant unintentionally were more likely to start ANC lately. It believed that planned pregnancies were more cared for by pregnant women and their family than unplanned pregnancies; this made them utilizing early ANC. Liked this study after adjusting other factors, it showed that unplanned pregnancies were more likely to start ANC lately than planned pregnancies (AOR= 1.24, CI 0.63-2.63, p-value= 0.534) insignificantly. This may be due to they did not know about the right time of gestational age for starting ANC, only 6.6 % of them knew the right time to start ANC while it was reported 27.3 % in a previous study of Uganda [43]. The study found that pregnant women who come late for antenatal care in Mulago hospital, Uganda were not well-informed about the right gestation age at which they should make their first antenatal care visit. But there was no significant association in this study.

Type of family was no statistically significant association with time to start ANC in this study. Nuclear families were more likely to start ANC early than joint families, liked previous study in Nigeria [41]. And husbands of postpartum women were more likely to affect them to start ANC early than themselves or their parents insignificantly. Their husbands' age, education level and occupation also

seemed to be insignificantly associated too, liked study in Nigeria [41]. Almost of teenage husbands were partners of teenage respondents so they consisted of many factors such as teenage postpartum women, low education, and unemployed. And after adjusting confounding factors it became insignificantly associated variable. With regard to advisors to ANC, this study presented that husbands of the postpartum women had role to be good advisors than parents but not significant. On the other hand, study in Tanzania found that not being supported by the husband or partner were identified as factors associated with a later antenatal care. [36]

Experiences in previous gravidity may have effects in decision to start ANC in this pregnancy. Study in Australia presented that last caesarean deliveries were more likely to seek ANC early due to more concerned about the risk of their pregnancy complications.[31] In this study, abnormal deliveries in previous gravidities were not significantly associated with time to start ANC, liked a study in Nigeria.[21] Otherwise aborted pregnancies in previous gravidities were significantly associated with time to start ANC firstly but finally it showed statistically insignificant relation after estimating by multiple logistic regressions.

5.3 Methodological concern

This study was a cross-sectional survey research due to limitation of time and aim of the study. This study examined the association between independent and dependent variables using chi-square tests and multiple logistic regressions. This study was conducted using self-administered questionnaires among postpartum women. Some questions were not clear to understand such as number of gravidity, awareness of birth control. Some questions were uncomfortable to answer marital status, planned or unplanned pregnancy. Furthermore, they had right to skip or refuse answering questions when they felt uncomfortable or did not want to answer the questions therefore much missing data occurred. Moreover, some important data in maternal and child health handbook came from the memory of them in previous time such as last menstruation period, so some cases could not define certain date for calculating certain

gestational age. This study could not find out the cause and effect because of time differences, hence recall bias might be occurred.

This study defined the first visit antenatal care when it was recorded in maternal and child health handbook. Some postpartum women utilized their first visits in private clinics but no records in handbooks, so these were not judged as first antenatal care visits for this study although they under stood that they had early antenatal care already.

The data was collected by coordinators in each hospital, some of them did not pay attention to recheck or evaluate it. Therefore, some questionnaires did not fill completely; especially date of first antenatal care, date of last menstruation period or number of visits. Some unreasonable data was found such as start first visit before delivery about 2 months but numbers of visits more than 10 times. This might be possible that coordinator training was insufficient either or the questionnaires were not clear for understanding.

CHAPTER VI
CONCLUSIONS AND RECCOMMENDATIONS

6.1 conclusions

This cross-sectional study was conducted in all hospitals of Mahasarakham Province, Thailand. The aim of this study was to determine the factors affected the time to start antenatal care of pregnant women and the prevalence of early and late antenatal cares in Mahasarakham Province. A total of 518 questionnaires were completed and returned from all hospitals of Mahasarakham Province. The response rate was 96.46%.

The mean age was 25.33 years old; the minimum age was 14 years; the maximum age was 44 years; most of postpartum women were young adult group (20-29 years old); 18.6 % of them were teenage pregnancies and 3 cases were girl-mom. Most are coupled (90.5%), multigravidity pregnancies (56.6%), high educated (Upper secondary and above) (55%), employed (58.9%), lived in rural area (76.4%), used nearby health service units (83.0%) and had Universal Coverage (UC) health insurances (66%).

The recognition of their pregnancies mostly was within 12 weeks of gestational age (75.9%). Awareness of birth control was about58.3% and awareness of first time to start ANC were only 6.6% of the postpartum women. Majority of them were planned pregnancies, only 11.8% were unplanned.

With regard to family, most of them were nuclear families (55.8%). About their husbands, median age was 28.75 years old and most of them were in young adult group (20-29 years old). Their most education levels were upper secondary and above (54.2%) and almost of them were employed (90%). Advisors for most postpartum women to start ANC were their husbands (46.7%). Attitudes of the most postpartum women for nearby health service units were good (94.8%), only 5.0% of them felt bad.

Minority of them had disability symptoms (1.4%), history of abortion (14.3%) and history of abnormal delivery (8.1%).

The postpartum women took at least 1 visit ANC before delivered 99.6%, 4 visits and more 94%, 5 visits and more 89.2% delivered without any ANC 2 cases (0.4%), started ANC within 12 weeks gestational age were 50.4% and took good quality of ANC 48.5%. (Good quality ANC is the ANC start within 12 weeks gestational age and 5 visits and above)

Based on Chi-square test results, there was a significant association between age (P-value < 0.001), education (P-value = 0.001), occupation (P-value < 0.001), health insurance (P-value < 0.001), pregnancy recognition (P-value < 0.001), awareness of birth control (P-value = 0.029), and pregnant planning (P-value = 0.009) with time to start ANC. Husband age (P-value<0.001), husband education (P-value=0.033), adviser to ANC (P-value=0.016), history of abortion (P-value=0.054 were associated with time to start ANC.

The model indicated that teen age pregnancies were about 3.84 times (95% CI 2.33-6.34) more likely to start ANC late than adults. Low educated (lower secondary and below) postpartum women were 1.84 times (95% CI 1.30-2.61) more likely to start ANC lately than high educated (upper secondary and above). Unemployed postpartum women were 1.92 times (95% CI 1.35-2.74) compared to employed.

UC- righted postpartum women were 2.35 times (95% CI 1.61-3.42) higher to start ANC late than non-UC-righted. Late recognition of their pregnancy made 57.16 times (95% CI 20.67-158.13) the chance to start ANC lately than early recognition. No birth control awareness and unplanned pregnancies were 1.51 (95% CI 1.04-2.19) and 2.11 (95% CI 1.20-3.69) times compared to other groups.

Teenage husband was 6.55 times 95% CI 2.49-17.28) more likely to start ANC lately than adult. Low education (lower secondary and below) of husband was 1.46 times (95% CI 1.03-2.08) higher than high education (upper secondary and above). And postpartum woman advised to ANC by her parent was 1.82 times (95% CI 1.12-2.96) compared to who decided by herself.

Postpartum women with history of abortion were 1.64 times (95% CI 0.99-2.71) higher to start ANC early than other. Focus on postpartum women with disability symptom, it found that all of them started antenatal care early significantly

although the data was too small. This might be possible that the disability symptom led them early to contact physicians and were advised to utilize ANC earlier.

In the final model of multiple logistic regression, age group and health insurance were found to have a statistically significant association with time to start ANC. Teenage pregnancies were 2.39 times (95% CI 1.31-4.34, p-value=0.004) more likely to start ANC lately than adults. And UC- righted postpartum women were 1.66 times (95% CI 1.11-2.49, P-value=0.013) higher to start ANC lately than non-UC-righted.

With regard to recognition of pregnancy, it showed that 125 postpartum women (24.1% of all) once recognized or accepted their pregnant status understood that their pregnancies were more than 12 weeks gestational age so all of them might start ANC lately too. But there were 4 of them started ANC early because they thought that they were pregnant but really they were not, this might be due to misunderstanding about their menstrual period.

Summary, this study showed that prevalence of early ANC in Mahasarakham Province was still low, far from the national target (60%) and very far from developed countries. It still found no ANC mothers, high prevalence teenage mothers and young teenage mothers (girl mom). Only 6.6 % of mothers knew right time to start ANC. About 24.1% of pregnant women could not recognize their pregnant status in first 12 weeks gestational age therefore they started ANC lately too. Otherwise, every postpartum woman with disability symptom started ANC early. Teenage pregnancy and UC-righted health insurance were significant predictors for late ANC.

Moreover, this study also showed that antenatal care system including quality, thorough distribution of health service units and easiness of utilization were acceptable for most postpartum women.

6.2 Recommendations

Antenatal care system in Thailand is one of the best systems in the world. Starting antenatal care within 12 weeks gestational age and at least 5 visits with one ultrasound detection by doctor have been done in everywhere of country, not only urban but also rural area. Policy of free antenatal care for any women, any rights of health insurances, anywhere for pregnant women to utilize antenatal care services in government hospitals influences chances to perceive antenatal care of pregnant women more quickly and continuously. Because in the past they must utilize the cares from only the service units that they registered, if not they must pay for the services.

Finding from this study shows that teenage pregnancy is still main problem in maternal and child health. To prevent this, national standard education should be revised all levels. It is kindly recommended that arts, sport and musical education should be more influenced, not only in primary level but all levels. It is kindly recommended that sexual health education in young teen-age group should be announced for national standard education. The contents should involve nature of reproduction, how to using birth prevention, disadvantage of teenage pregnancy, signs and symptoms of pregnancy, how to manage with unwanted pregnancy, how to do with continuing pregnancy and importance of antenatal care. And it should stress in both girls and boys.

About public health policy, it is kindly recommended that free abortion should be considered for unwanted pregnancy especially in adolescents. There should be center for termination in at least every province. The regulations for this should be announced to public recognition in order to pregnant women and their families can rapidly adjust what to do about their unwanted pregnancies.

Cut point of time to decide late antenatal care should be raised from 12 weeks gestational age to 3 months because of comfort to public advertise and easiness to understand and remember of people.

It is kindly recommended that teenage mothers should avoid being pregnant again in teenage period by contraceptive using. Especially young teenage mother should receive advice for long-action contraceptive drug such as Norplant.

In hospital, it is kindly recommended that there should be connections with all schools to promote sexual health education for teenagers. There should be special

clinic for teenagers to utilize easily and confidentially and center of free condoms and emergency pills for them to prevent pregnancy. And in postpartum wards, it is kindly recommended that postpartum women and their families should be advised not only their postpartum guideline but also the right period to start antenatal care utilization for their next gravidities.

In village, it is kindly recommended that social health volunteers should be trained and taught for knowledge about ANC. They can help to search and identify pregnant women in responsible areas for guidance them to utilize antenatal care quickly or earlier. They should receive some pregnancy strip tests for suspected cases that were not sure and uncomfortable to utilize at health service units.

It is kindly recommended that all husbands who want new children should be advised for the right period to start antenatal care utilization too. Because this study showed that husbands have more effects for postpartum women to start antenatal care early than others.

It is kindly recommended that right time to start ANC should be announced for understanding of all people in village. Teenage pregnancy with teenage husband, low education, unemployed and UC-righted health insurance should be watched out.

It should integrate all stakeholders in community to set strategy together for teenage pregnancy. They should go out for studying other communities with successful management.

In the future, it is kindly recommended that further study should be done in adult mothers or teen age mothers separately. Because teenage mothers causes many confounding factors to the study so it cannot define factors that significantly affect against time to start antenatal care in others. It should design questionnaire without uncomfortable answers such as earning, planned or unplanned pregnancy. Coordinators should be trained and evaluated for clearly understanding the questionnaires.

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APPENDICES

APPENDIX A

Factors Associated With Late Antenatal Care Visit Among Pregnant Women In Mahasarakham Province, Thailand

Age.....year

Resident sub district .....district .....province…….

Date ……..

Part 1. For respondent

1.education level □ graduate □ upper secondary □ lower secondary □ primary □ other ……

2.Occupation □ official □ owner business □ labor □ student □ worker □ no work □ other.....

3.Marital status □ single □ couple □ separate □ divorce □ widow

4.Number of children before this pregnancy □.....children □ none

5.health insurance □ Government Or State Enterprise Officer □ Social Security Scheme □ UC □ No

6. Personal illness □..... □ none

7 Awareness of birth control . □ yes such as ....., ..., ... □ no

8. Pregnancy planning □ planned □ unplanned

9. **Stay with** □ husband and children only □ husband and children and parents □parents

9. Husband's age ……years

10. Husband's education □ graduate □ upper secondary □ lower secondary □ primary □ other ……

11. Husband's occupation □ official □ owner business □ labor □ student □ worker □ no work □ other.....

Part 1. For respondents (continued)

1. Gravidity of this pregnancy □1. 1st □2. 2nd □3. 3th or more

2. Gestational age when you know that you were pregnant

.....months/weeks

3. Gestational age when started antenatal care..... months/weeks

4. Advisor to start antenatal care

□ 1. Husband □ 2. Mother □ 3. Parent □ 4. .....

5. Did you know gestational age that should start antenatal care

□ 1.yes.....weeks □ 2.no

6. First start antenatal care at

□ Sub district hospital □ District hospital

□ Province hospital □ Private hospital/ clinic/

7. first start antenatal care at nearby health service unit □ yes □ no

8. Quality of antenatal care at nearby health service unit

□1. Good □ 2. Bad

9.illness before first start antenatal care

□1.None or little □2. Serious

"Thank you very much for taking the time to answer these questions"

Part 2. Data from maternal and child handbook filled by coordinator

1. First antenatal care record at

□ Sub district hospital □ District hospital

□ Province hospital □ Private hospital/ clinic

2. History of previous pregnancy

1st Gravidity o abortion o normal labour o abnormal labour

2nd Gravidity o abortion o normal labour o abnormal labour

3rd Gravidity o abortion o normal labour o abnormal labour

4th Gravidity o abortion o normal labour o abnormal labour

5th Gravidity o abortion o normal labour o abnormal labour

3. about this pregnancy

Gravidity..... LMP..... EDC.....

Date of first start ANC..... GA……weeks

Numbers of all visits.....times

Thanks for cooperation of recording data to the query

If you had problems about questionnaire

Please contact

Dr. Prapant soontornpagasit

Wapipathum Hospital

Tel. 081-8717461

APPENDIX B

New WHO antenatal care model basic component checklist

Note: Mark the activities carried out as appropriate (unshaded boxes).
(Use the closest gestational age at the time of visit.)

Name of patient_____**Address & telephone No.**_____

Clinic record No._____

FIRSTVISIT for all women at first contact with clinics, regardless of gestational age. If first visit later than recommended, carry out all activities up to that time DATE: / /	visits 1st <12 wks	2nd	3rd	4th
Classifying form which indicates eligibility for the basic component of the program				
Clinically severe anemia? Hb test				
Ob. exam: gestational age estimation, uterine height				
Gyn. exam(can be postponed until second visit)				
Blood pressure taken				
Maternal weight/height				
Rapid syphilis test performed, detection of symptomatic STIs				
Blood type and Rh requested				
Tetanus toxoid given				
Fe/Folic acid supplementation provided				
Recommendation for emergencies/hotline for emergencies				
Complete antenatal card				
SECONDVISIT and SUBSEQUENTVISITS DATE: / /	Gestationalage–approx.#ofweeks 26 wks	32 wks	38 wks	
Clinical examination for anaemia				
Ob. exam: gestational age estimation, uterine height, fetal heart rate				
Blood pressure taken				
Maternal weight (only women with low weight at first visit)				
Urine test for protein (only nulliparous women/women with previous pre-eclampsia)				
Fe/Folic acid supplementation given				
Recommendation for emergencies				
Complete antenatal card				
THIRD VISIT: add to second visit DATE: / /				
Haemoglobin test requested				
Tetanus toxoid (second dose)				
Instructions for delivery/plan for birth				
Recommendations for lactation/contraception				
FOURTH VISIT: add to second and third visits DATE:				
Detection of breech presentation and referral for external cephalic version				
Complete ANC card, recommend that it be brought to hospital				

Staff responsible for antenatal care: Name _____

Signature _____

Source: Antenatal Car Randomized Trial: Manual for the Implementation of the New Model: WHO2002

New WHO antenatal care model basic component checklist

APPENDIX C

New WHO antenatal care model basic component checklist apply for Thailand

FIRST VISIT: DATE: / / (before12 weeks)		visits			
	1st	2nd	3rd	4th	5th
1. Classifying form which indicates eligibility for the basic component of the program					
2. Maternal weight/height, blood pressure taken					
3. General exam. Ob. exam: gestational age estimation, uterine height					
4. Urine test for Protein, Sugar, Nitrite และ Leukocyte esterase					
5. Heart and lung exam. by doctor					
6. Gyn. exam(can be postponed until second visit)					
7. Hb / Hct / OF / DCIP and VDRL, Anti HIV, Blood gr, Rh typing, HBsAg					
8. Tetanus toxoid given					
9. Fe/Folic acid and iodinesupplementation provided					
10. School of parent 1st time, recommendation for emergencies/hotline for emergencies					
SECOND VISIT: DATE: / / (20 weeks)					
1. Maternal weight/height, blood pressure taken					
2. Urine test for protein and sugar					
3. General exam. for anemia and edema					
4. Ob. exam: gestational age estimation, uterine height, fetal heart sound					
5. Gyn. exam(when not done in first visit)					
6. Abdominal ultrasound					
7. Fe/Folic acid, iodine and calcium supplementation given throughout pregnancy					
8. Tetanus toxoid (second dose, after first dose at least 1 month)					
9. Recommendation for emergencies					
THIRD VISIT: DATE: / / (26 weeks)					
1. Advise maternal observation for fetal movement					
FOURTH VISIT: DATE: / / (32 weeks)					
1. Hb/Hct. VDRL, Anti HIV					
2. School of parent 2nd time, Instructions for delivery/plan for birth					
Recommendations for lactation/contraception					
FIFTH VISIT: DATE / / (38 weeks)					
1. Detection of breech presentation and referral for external cephalic version or surgery					
2. If undelivered until 41 weeks, recommend for induction of labour in hospital					

Staff responsible for antenatal care: Name _____

Signature _____

Source: คู่มือการดูแลผู้ตั้งครรภ์แนวใหม่: ศูนย์อนามัยที่ ๖ ชอนแก่น กรมอนามัย กระทรวงสาธารณสุข

Basic Component Check List in Thailand

APPENDIX D

Compare variables about teenage and adult groups

Variables	Teenage and adult				
	n	teen %	adult %	Crude OR (95% CI)	P-value
Marital status					
Single	49	34.7	65.3	2.63 (1.39-4.96)	**0.003**
Coupled	469	16.8	83.2	1	
Gravidity group					
Primigravida	224	36.6	63.4	11.55(6,33-21.28)	**<0.001**
Multigravida	294	4.8	95.2	1	
Education level					
Low	233	29.2	70.8	3.78(2.34-6.12)	**<0.001**
High	285	9.8	90.2	1	
Occupation					
Unemployed	305	33.8	66.2	5.98(3.61-9.90)	**<0.001**
Employed	213	7.9	92.1	1	
Health insurance					
UC	342	25.4	74.6	6.33(3.10-12.92)	**<0.001**
Non-UC	176	5.1	94.5	1	
Pregnancy recognition					
>12 wks.	125	33.6	66.4	3.18(1.99-5.08)	**<0.001**
<.12 wks	393	13.7	86.3	1	
Awareness of birth control					
No	168	33.3	66.7	3.88(2.45-6.14)	**<0.001**
Yes	350	11.4	88.6	1	
Planned or unplanned pregnancy					
Unplanned	61	44.3	55.7	4.47(2.53-7.87)	**<0.001**
planned	457	15.1	84.9	1	
Husband age					
Teen age	49	90.9	9.1	71.27 (21.09-221.39)	**<0.001**
Non teen age	469	12.3	87.7	1	
Missing	88				

BIOGRAPHY

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