FACTORS RELATED TO THE ACCEPTANCE OF THE NEW ANTENATAL CARE PROTOCOL AMONG HEALTH PERSONNEL IN SUPHAN BURI PROVINCE, THAILAND

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FACULTY OF GRADUATE STUDIES

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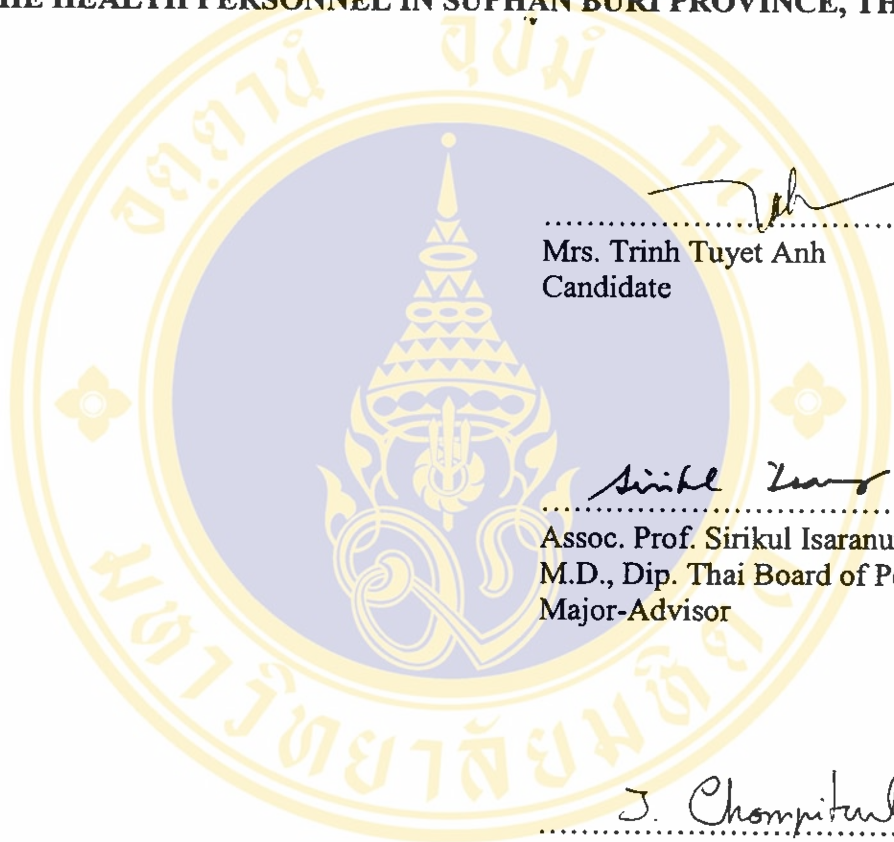

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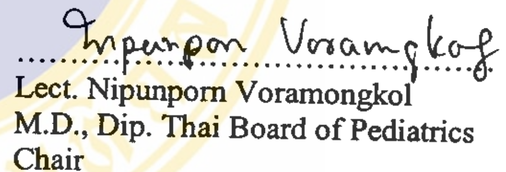
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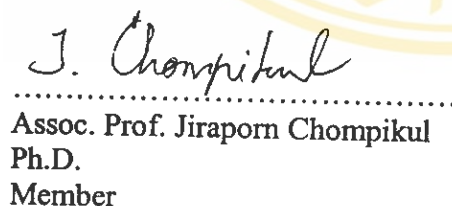
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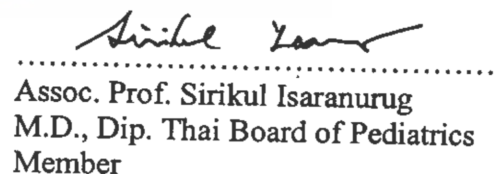
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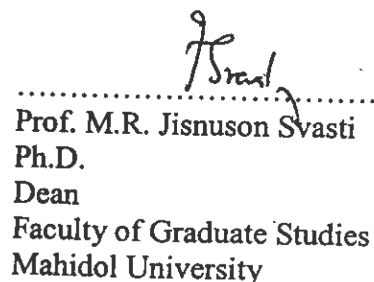
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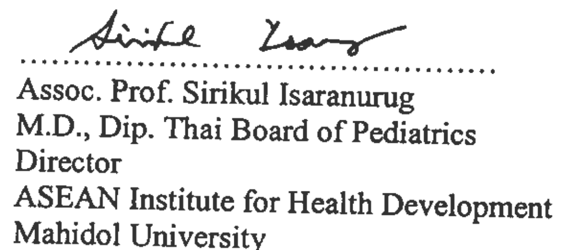
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FACTORS RELATED TO THE ACCEPTANCE OF THE NEW ANTENATAL CARE PROTOCOL AMONG HEALTH PERSONNEL IN SUPHAN BURI PROVINCE, THAILAND

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ABSTRACT

A cross-sectional study was conducted to determine the factors related to the acceptance of the new antenatal care protocol (ANC) among health personnel in Suphan Buri province. The sample consisted of 179 personnel who were working in the ANC field in this province. Data were collected from 7th January to 29th January 2007 by using self-administered questionnaires accompanied by a comparison form between the new protocol and the conventional one. Data analysis was performed using Pearson's Product Moment Correlation, Chi-Square test and Multiple regression analysis using Stepwise procedure.

The study revealed that 63.9% of the health personnel accepted the new ANC protocol. The favorable attitude towards the new ANC protocol, available facilities, the presence of supporting policies, and favorable peer opinions were found to be significantly associated with the acceptance of the new ANC protocol among health personnel (P-value < 0.05). The regression model with these four factors could explain up to approximately 65% of change in the acceptance of the new antenatal care protocol among health personnel.

These findings suggest that health administrators should provide health personnel with information and training about the new ANC protocol as well as providing supporting policy and adequate facilities. The four factors mentioned above would be critical factors to be considered in implementing the new ANC protocol.

KEY WORDS: ACCEPTANCE/ THE NEW ANC PROTOCOL/ HEALTH PERSONNEL

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CONTENTS

Page

ACKNOWLEDGMENTS …..……………………………………………………...….iii
ABSTRACT ……………………………………………...…………..……..….iv
LIST OF TABLES ………………...………………………………………..…....vi
LIST OF FIGURES …..……………………………………………………..…….vii
LIST OF ABBREVIATIONS ……………………………………..……...……….viii
CHAPTER

1 INTRODUCTION
1.1 Rationale and Justification ………………….…………………………..……..1
1.2 Research Question ……………………………………………………………….5
1.3 Research Objectives ……………………………………………………….….5
1.4 Research Hypothesis ……………………………………………………….….6
1.5 Conceptual Framework ………………………………………………….….6
1.6 Variables and Operational Definition ……………..……………………………...7
1.7 The limitation of study …………………………………………………………..8

2 LITERATURE REVIEW
2.1 What is Antenatal Care? ………………………………..…..………….….9
2.2 What is The New Antenatal Care Protocol? …………………...……..10
2.3 Principles underlying The New WHO Antenatal Care Model ..…...…….13
2.4 The Precede-Proceed Model …………..………………………………14
2.5 Studies relating to The New Antenatal Care Protocol ………….………..…21
2.6 The Comparison Between The New WHO Antenatal Care Protocol
and The Conventional Protocol ……………………………………………...24

3 RESEARCH METHODOLOGY
3.1 Study Design ………………………………………………….……………29

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CONTENTS (Cont.)

Page

3.2 Study Population and Sample ……….……………………………………..29
3.3 Sample Size ………………………………………………………………..29
3.4 Data Collecting Tools and Methods ……..………..……………………….30
3.5 Data analysis procedure ………..…………..………..……………………31

4 RESULTS
Results ……….……………………………...……………………………….34

5 DISCUSSION
Discussion …………………………………………………………………..49

6 CONCLUSION AND RECOMMENDATION
Conclusion ………………………….………………………………….…….....59
Recommendation ………………………………………………..……………..62

REFERENCES ……………...……………………………………………………….65

APPENDIX ………………...………………………………………………..……69

BIOGRAPHY ……………………..……………………………………………...……80

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LIST OF TABLES

TABLE Page

1 Number and percentage of the general information of the health personnel ....…..36

2 Acceptance of the new antenatal care protocol among the health personnel …….37

3 Number and percentage of the attitude of the health personnel towards the new ANC protocol …..…………...……………………………………….……...….38

4 Number and percentage of the training received on antenatal care of the health personnel …………..………………………………………..….….……….39

5 Number and percentage of the facility availability in hospitals/health centers 40

6 Number and percentage of the supporting policy towards the new ANC protocol ………...………...…………………………………………………….41

7 Percentage of each statement in the peer opinions towards the new antenatal care protocol …………..…………………………...…………………….…….42

8 Correlation coefficient between the predisposing factors, the enabling factors the reinforcing factors and the acceptance of the new ANC protocol among health personnel ………………..……….....……………………………...………43

9 Association between the professional background and the acceptance of the new antenatal care protocol among the health personnel ……...…………...……..44

10 Multiple regression analysis between factors and the acceptance of the new ANC protocol among health personnel …………………………………….47

11 Stepwise multiple regression analysis between factors and the acceptance of the new ANC protocol among health personnel …………..…………………….…48

12 Acceptance of the new antenatal care protocol among the health personnel ……76

13 Attitude of the health personnel towards the new antenatal care protocol …...….77

14 Training received on antenatal care ………………..……………………………78

15 Supporting policy towards the new ANC protocol ……………………………...78

16 Facility availability in hospital/health center ……………………………………79

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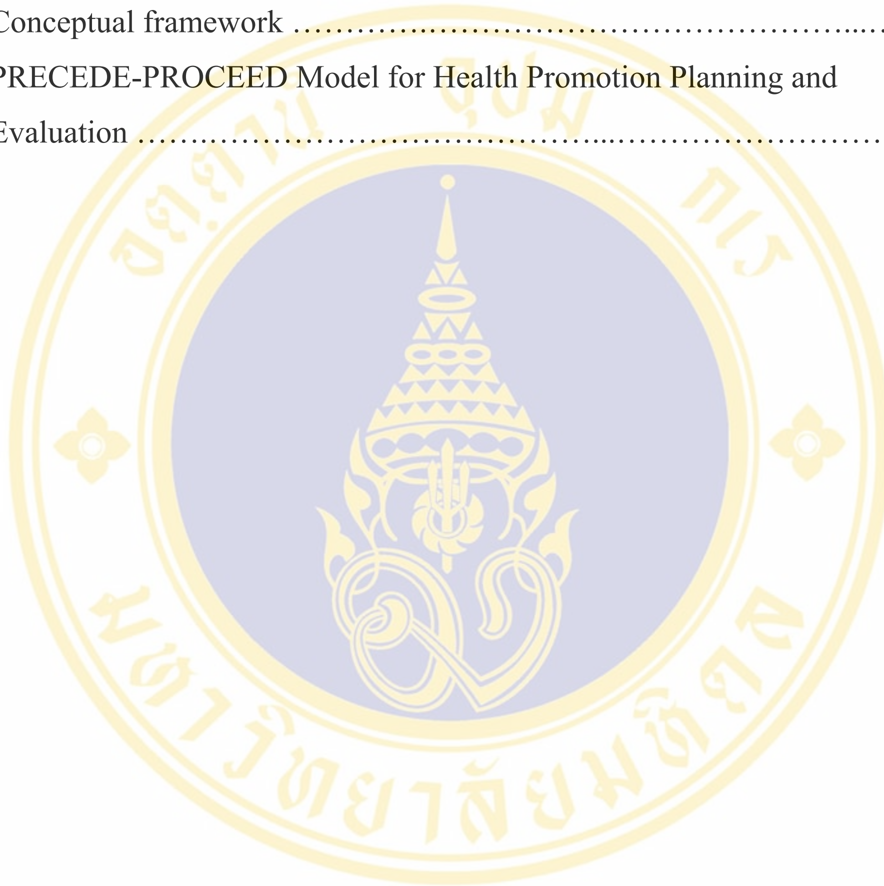
LIST OF FIGURES

FIGURE Page

1 Conceptual framework ………….………………………………………..…………….6
2 PRECEDE-PROCEED Model for Health Promotion Planning and
Evaluation ………………………………...…………………………..…….17



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LIST OF ABBREVIATIONS

ANC : Antenatal care

WHO : World Health Organization

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CHAPTER 1
INTRODUCTION

1.1 Rationale and justification

The rationale for providing antenatal care is to screen predominantly healthy pregnant women to detect early signs of, or risk factors for, abnormal conditions or diseases and to follow this detection with effective and timely intervention. The recommended antenatal care program in most developing countries is often the same as the programs used in developed countries. However, in developing countries there is wide variation in the proportion of women who receive antenatal care (1).

Healthcare for pregnant women is an important component of public health services. But what is the best model for this care? What are the optimal content, frequency and timing of antenatal visits?

Getting early and regular prenatal care is crucial because it allows the health care provider the chance to find problems early so they can be treated as soon as possible. During prenatal visits, the health care provider teaches the woman about pregnancy, monitors any medical conditions she may have, tests for health problems with the mother and baby, and refers the woman to needed services such as a support group, childbirth class (2).

Antenatal care can help keep the mother and her baby healthy. Babies of mothers who do not get antenatal care are three times more likely to have a low birth weight and five times more likely to die than those born to mothers who do get care. Doctors can spot health problems early when they see mothers regularly. This allows doctors to treat them early. Early treatment can cure many problems and prevent others (3).

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The consequences of failing to provide good maternal and childcare can be seen in the disturbing statistics of maternal and neonatal morbidity and mortality for developing countries. Actually, ANC programs have been recommended for developing countries along the lines of those used in developed countries, with only minor adjustments for local conditions. Many of the components of these antenatal programs have not been subjected to rigorous scientific evaluation to determine their effectiveness (4).

Of all health statistics mentioned by the World Health Organization (WHO), maternal mortality is unique in showing the largest discrepancy between developed and developing countries. Approximately 90 % of maternal deaths (more than 0.5 million each year) occur in developing countries. Over the last century, almost all countries have accepted antenatal care principles (5).

However, insufficiency of resources and lack of women's compliance were the main handicaps in developing countries and compelled these countries to apply various standard programs. Unfortunately, these programs are not sufficiently effective in the prevention and treatment of maternal mortality. Fixing the number (quantity) of antenatal visits and the static approach affect the quality of antenatal care (5).

It is indeed striking that even today little is known about the effectiveness of routine antenatal care in reducing maternal mortality and morbidity. Despite a widespread desire to improve maternal care services, the lack of 'hard' evidence has impeded the identification of effective interventions and thus the optimal allocation of resources. In developing countries, these programs are often poorly implemented and clinical visits are irregular, with long waiting time and poor feedback to the women (6).

Almost all of the hospitals in developing countries fall into this kind of problems. Everyday, every of these hospital has averagely 200 to 250 cases. The health

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personnel in ANC unit only include about 2 doctors and 5 midwives while antenatal care regimes used involve 12 to 15 antenatal visits during a pregnancy (7).

Everyone can be aware of the amount of work that they have to cope with everyday. They start to work at 7 am till 11:30 am, and then from 1 pm to 4:30 pm. They regularly have late lunch and come home after 5 pm because till have so many clients waiting for their services. These overload work sometimes make them burst into anger with their patients (8)

What about pregnant women? They have to come to the hospitals very early in the morning, queue to wait for their turns. Often, they have to wait for 1 hour to 1 and a half hour and even 2 hours in a very noisy and crowded hospital environment. And then they come in to see health personnel in only 5 to 10 minutes. And sometimes the health personnel grumble them at coming later than appointed date. How can they be satisfied with this kind of service? Being a pregnant woman, she has many questions as well as wonders that need to be clear. She needs much more than only 5 to 10 minutes as well as smiles from the health personnel, not gloomy faces.

We can estimate the big quantity of the health personnel work, the low qualitative services and the amount of time a pregnant woman has to wait for services. Too many visits with too many clients at the same time and only a few care providers increase the work burden and stress as well as reduce the quality of care. In addition, transportation fee, long waiting time and poor feedback to pregnant women should be considered.

Researchers from the World Health Organization (WHO) conducted the largest randomized trial in the ANC topic, and by reviewing evidence from trials of antenatal care around the world. Surprisingly, they found that more frequent visits by pregnant women to health clinics do not necessarily lead to better health outcomes. Models of antenatal care involving fewer visits could be introduced without risk to mothers or babies and could reduce healthcare costs (9).

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Most observational studies have shown that women who visit medical clinics more often during their pregnancy have fewer health problems than those who attend less frequently. Yet, comparative trials suggest that antenatal care models based on a lower number of visits are as effective as the standard model (10).

WHO has developed a focused ANC package that includes only counseling, examinations, and tests that serve immediate purposes and have proven health benefit. The result of WHO trials showed that there were no significant differences between the new and standard model in terms of severe anemia, pre-eclampsia, urinary-tract infections or low birth weight infants; there were no significant differences in secondary outcomes for either women or infants (9).

For normal pregnancies, WHO recommends only fours antenatal visits. The major goal of focused antenatal care is to help women maintain normal pregnancy through:

- Identification of pre-existing health conditions
- Early detection of complication arising during the pregnancy
- Health promotion and disease prevention
- Birth preparedness and complication readiness planning (9)

This new model of antenatal care is being implemented in Khon Kaen province, Thailand. Action has been required at all levels of the health-care system, from consumers through to health professionals, the Ministry of Public Health and international organizations. This experience is a good example of moving research findings into practice, and it should be replicated elsewhere to effectively manage other health problems (1).

The new model is as good as the standard one in detecting and preventing five serious medical conditions related to pregnancy (pre-eclampsia, urinary tract infection, postpartum anemia, maternal mortality and low birth weight). The cost of

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the new model is equal to or less than that of the standard system. Pregnant are satisfied with the lower number of antenatal visits provided by the new model.

Determining the various factors relating to the acceptance of the new ANC protocol among health personnel will be beneficial in considering to introduce the new protocol into practice nationwide in order to reduce workload, release hospital staff and buildings for other uses, increase quality of antenatal care and save money. It can become considered inputs for the government to update national clinical standards and guidelines for ANC, modify pre-service training curricula in ANC, in-service training for ANC providers and their supervisors.

1.2 Research question

What are the factors related to the acceptance of the new antenatal care protocol among health personnel working in ANC units in Suphan Buri province, Thailand?

1.3 Research objectives

1.3.1 General objective

To determine the factors related to the acceptance of the new antenatal care protocol among health personnel in Suphan Buri province, Thailand.

1.3.2 Specific objectives

1. To determine the association between predisposing factors and the acceptance of the new ANC protocol among health personnel
2. To determine the association between enabling factors and the acceptance of the new ANC protocol among health personnel
3. To determine the association between reinforcing factors and the acceptance of the new ANC protocol among health personnel

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1.4 Research hypothesis

There are associations between the predisposing factors, the enabling factors, the reinforcing factors and the acceptance of the new ANC protocol among health personnel.

1.5 Conceptual framework

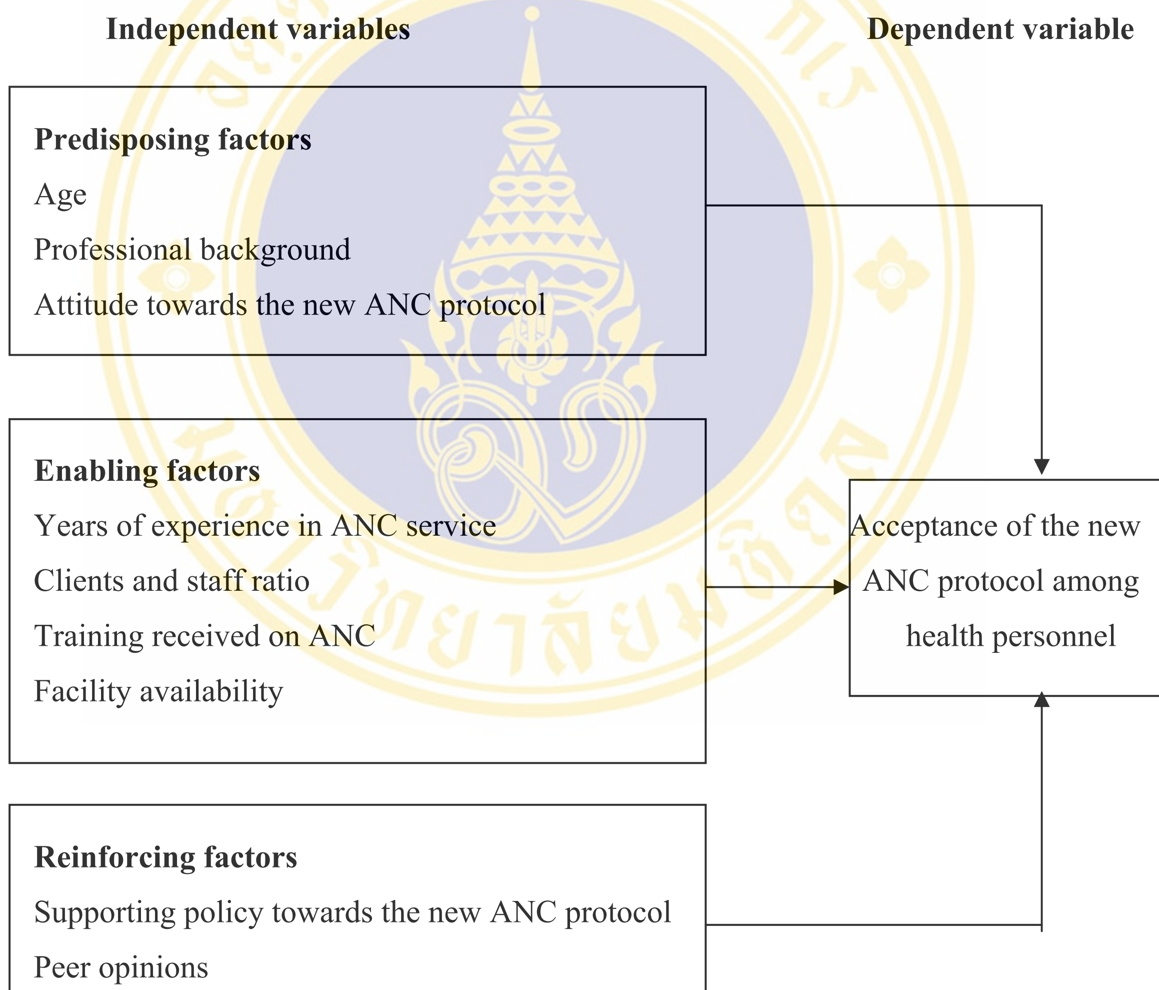

Figure 1 Conceptual framework

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1.6 Variables and Operational definition

Health personnel referred to doctors, nurses, midwives, community health workers who were working in ANC field.

Acceptance of the new ANC protocol among health personnel referred to the positive opinions on the new ANC protocol among health personnel.

Age was determined as complete years of health personnel at the time of answering the questionnaire in full year. The age of health personnel was grouped into three categories: less than 30, 30 to 45, more than 45.

Professional background referred to the background of the health personnel. Professional background could be general doctor, obstetrician, midwife, nurse, and community health worker.

Attitude towards the new ANC protocol referred to feelings expressed by the health personnel towards the new ANC protocol

Years of experience in ANC service referred to duration of service in ANC unit. This variable was grouped into three categories: less than 10 years, 10-20 years, more than 20 years.

Client and ratio referred to the quotient of the division of the number of clients by the number of health personnel per day. This variable was grouped into three categories: less than 10, 10 to 20 and more 20.

Training on ANC referred to the training received on ANC of staff members.

Facility availability referred to the essential facilities required in ANC units.

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Supporting policy towards the new ANC protocol referred to the policy of hospitals in supporting to implement the new ANC protocol.

Peer opinions referred to the fact that the health personnel hear about the opinions of the new ANC protocol from their fellows, their friends…

1.7 The limitation of the study

The mailed questionnaire was used for the study, in case health personnel answered the questionnaires with some missing answers, the information could not be collected adequately.

The study was conducted in one province which was purposively selected as the research would get high cooperation, so that the findings might not represent the information of other provinces.

The acceptance of health personnel was determined through the opinion of the comparison between the conventional ANC protocol and the new protocol provided, not in real experience of health personnel.

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CHAPTER 2
LITERATURE REVIEW

2.1 What is antenatal care?

Antenatal care is the care a woman gets while she is pregnant. This care can be provided by a doctor, midwife or other health care professional. The goal of antenatal care is to monitor the progress of a pregnancy and to identify potential problems before they become serious for either mom or baby. All mothers-to-be benefit from prenatal care. Women who see a health care provider during pregnancy have healthier babies, are less likely to deliver prematurely, and are less likely to have other serious problems related to pregnancy. During antenatal visits, the health care provider:

- Teaches the woman about pregnancy
- Monitors any medical conditions she may have
- Test for problems with the baby
- Tests for health problems in the woman
- Refers the woman to services such as support groups, the Women, Infants and Children program or childbirth education classes (10).

In theory, antenatal care reduces maternal and perinatal morbidity and mortality directly through the detection and treatment of pregnancy-related or intercurrent illness or indirectly through the detection of women at increased risk of complications of delivery by ensuring that they are cared for in a suitably equipped facility. The basic content of care at each visit has not changed substantially over the years, although modern technology has led to the introduction of several new elements in pregnancy surveillance (11).

As maternal and perinatal outcomes improved dramatically in the developed world, antenatal care was given much of the credit despite a lack of evidence for its precise benefits. In countries where women usually attend antenatal services early in

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pregnancy, the average number of visits is 10–12, and attendance rates are nearly 100%. Recently, trials have indicated that reducing the number of antenatal visits does not affect overall outcome (1).

In developing countries, where 80% of the world's women live, the process of pregnancy and childbirth is still sometimes quite dangerous (12). The recommended programs of antenatal care in most developing countries are often similar to those used in developed countries. However, departure from the standard programs is almost always the rule, usually the result of insufficient resources or women's lack of attendance (13). Surveys from a number of developing countries done between 1980 and 1989 revealed that coverage of antenatal care ranged from 50% to 90% (14).

2.2 What is new antenatal care protocol?

The consequences of failing to provide good maternal and perinatal care can be seen in the disturbing of maternal and neonatal morbidity and mortality for developing countries. Traditionally, antenatal care (ANC) programs have been recommended for developing countries, with only minor adjustments for local conditions. Most of the antenatal care models currently in use around the world have not been subjected to rigorous scientific evaluation to determine their effectiveness. Despite a widespread desire to improve maternal care service, this lack of “hard” evidence has impede the identification of effective interventions and thus the optimal allocation of resources. In developing countries, routinely recommended antenatal care programs are often poorly implemented and clinical visits can be irregular, with long time waiting times and poor feedback to the women (9).

To address this paucity of information, the UNDP/UNFPA/WHO/World Bank Special Program for Research, Development and Research Training in Human Reproduction (HFP) implemented a multicenter randomized controlled trial that compared the standard “Western” model of antenatal care with a new WHO model that limits the number of visits to the clinic and restrict the tests, clinical procedures

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and follow-up actions to those that have been shown to improve outcomes for women and newborns (9).

In the standard model currently in use, women made visits to the clinics once a month for the first six months of pregnancy, once every 2-3 weeks for the next two months, and then once a week until delivery. In this scenario, a woman would have about 12 visits to the clinic during her pregnancy. In the standard model, women were routinely screened with urinary tests for proteinuria and infections, and with blood tests for syphilis, haemoglobin measurements and blood group typing (9).

In the new WHO model, women were evaluated on their first visit to the clinic to see if they require special care for existing medical conditions. Those requiring special care were not eligible for the basic component of the new WHO model. Women considered not being at risk or having existing medical conditions were offered the four-visit schedule of the basic component of the new WHO model. Activities in the basic component of the new WHO model included: screening for health conditions likely to increase the risk of specific adverse outcomes, therapeutic interventions known to be beneficial; and alerting pregnant women to emergencies and instructing them on appropriate responses. Clinics employing the new WHO model were provided with the resources necessary to implement these activities (9).

At the outset, the new WHO antenatal care model segregates pregnant women into two groups: those eligible to receive routine ANC (called the basic component); and those who need special care based on their specific health conditions or risk factors. Pre-set criteria are used to determine the eligibility of women for the basic component. The women selected to follow the basic component are considered not to require any further assessment or special care at the time of the first visit regardless of the gestational age at which they start the program. The remaining women are given care corresponding to their detected condition or risk factor. The women who need special care will represent, on average, approximately 25% of all pregnant women initiating antenatal care (9).

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It is likely that clinics will already have some sort of risk-scoring form that attempts to identify pregnant women at risk of complications in pregnancy or childbirth. This form will have to be replaced by the classifying form of the new WHO model. The format of the form can be adapted to the format of medical records in use in the clinic, but its contents should remain unchanged. The form contains 18 checklist questions that require binary responses (yes/no). They cover the patient's obstetric history, their current pregnancy and general medical conditions. Women who answer 'yes' to any of the 18 questions would not be eligible for the basic component of the new WHO antenatal care model; they should receive care corresponding to the detected condition (9).

It is possible that a woman who is initially referred to a higher level of care because of a condition identified in the classifying form is subsequently considered suitable to follow the basic component of the new WHO model. In such a situation, the woman would have to undergo all the activities included in the basic component that correspond to her fetus's gestational age. In addition, she would have to undergo all activities that she missed owing to her late entry into the basic component that were not performed during her visit(s) to the higher level of care (15).

The activities included in the basic component fall within three general areas:

- Screening for health and socio-economic conditions likely to increase the possibility of specific adverse outcomes;
- Providing therapeutic interventions known to be beneficial; and
- Educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them (9)

It is important to emphasize that the basic component of the new WHO antenatal care model is intended only for the management of pregnant women who do not have evidence of pregnancy-related complications, medical conditions or major health-related risk factors. For the management of women who have such conditions, health providers are advised to follow the recommended established procedures of their clinic or hospital (9).

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When necessary, women enrolled in the basic component of the new WHO model can be referred for specialized care, such as nutritional or psychiatric advice. It is considered that the basic component schedule will not need to be lengthened to accommodate these women. If such specialized care is necessary, the provision and format of such support should be left to specialists in these areas, while the women continue to follow the activities of the basic component (9).

2.3 Principles underlying the new WHO antenatal care model

The new WHO antenatal care model tested in the randomized controlled trial was based on the following principles: (1,9)

An antenatal care model should include a simple form that can be used easily to identify women with special health conditions and/or those at risk of developing complications; such women need to be referred to a higher level of care.

The identification of women with special health conditions or risk factors for complications should be done only when higher levels of care are known to have the expertise to deal with their specific health care needs.

Health care providers should make all pregnant women feel welcome at their clinic. The opening hour of clinics providing ANC should be as convenient as possible for women to come to the clinic. It has been shown that the number of women seeking antenatal care at clinics increases proportionally with increases in hours of operation of those clinics. Health care providers should make every effort to keep their appointments with women in order to reduce patient waiting time. However, women who come without an appointment should not be turned away even when there is no emergency. As far as possible, any required interventions (for treatment) or tests should be done at the women's convenience, for example, on the same day of the woman's visit (1).

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Only examinations and tests that serve an immediate purpose and that have been prove to be beneficial should be performed. If, for example, there is justification for performing a special test only once during pregnancy, it should be performed at the most appropriate time (7)

Whenever possible, rapid and easy-to-perform tests should be used at the antenatal clinic or in a facility as close as possible to the clinic. When test results are positive (e.g. positive for syphilis), treatment should be initiated at the clinic the same day.

Overall, the number of clinic visits was smaller for women enrolled in the new model, compared with those in the standard model, for all countries. In the new model, women visited clinics a median of only five times; the corresponding figure for the standard program was eight. Moreover, a greater proportion of women enrolled in the new model were referred to a higher level of antenatal care during the first two trimesters of pregnancy. Among the women referred, there were proportionally less referrals for pregnancy-induced hypertension, severe anemia, urinary-tract infections, diabetes or low uterine height; instead these women were more likely to be referred with a diagnosis of vaginal bleeding or rhesus iso immunization (16).

A comparison of the two groups of women enrolled in the study did not show any differences in secondary outcomes for either mothers or infants, including the rates of eclampsia and maternal and neonatal deaths. Thus, the fewer number of clinic visits by women in the new model did not appear to adversely affect outcomes for either mothers or newborns (9).

2.4 The PRECEDE-PROCEED Model

The best known and most often used model for health promotion programming is the PRECEDE-PROCEED Model. The PRECEDE Model was developed by Lawrence Green and Kreuter to help health educators to evaluate all factors involved

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in planning a community wide health program. The PRECEDE Model was named the PRECEDE-PROCEED Model because it acts with the implementation and evaluation of the program (17).

This model is considered the most popular model in health profession and it has been the basic model for many professional projects at the national level. All students should be familiar with this model.

The PRECEDE Model is a framework for the process of systematic development and evaluation of health education programs. An underlying premise of this model is that health education is dependent on voluntary cooperation and participation of the client in a process which allows personal determination of behavioral practices; and that the degree of change in knowledge and health practice is directly related to the degree of active participation of the client. Therefore, in this model, appropriate health education is considered to be the intervention for a properly diagnosed problem in a target population (18).

PROCEED was added to the model based on L. Green's experience with Marshell Krueter. PROCEED was added in recognition of the emergence of and need for health promotion interventions that go beyond traditional educational approaches to changing unhealthy behaviors. The administrative diagnosis is the final planning steps to 'precede' implementation. From there 'proceed' to promote the plan or policy, regulate the environment, and organize the resources and services, as required by the plan or policy (18).

The purpose of the PRECEDE-PROCEED Model is to direct initial attention to outcomes rather than inputs. This forces planners to begin the planning from the outcome point of view. The planning process outline in the model rests on two principles:

- The principle of participation
- The important role of the environment factors

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Description of the Model

PRECEDE- the first 5 phases

Phase 1-Social Diagnosis

Phase 2-Epidemiological Diagnostic

Phase 3-Behavioral & Environmental Diagnostic

Phase 4-Education & Organization Diagnostic

Phase 5-Administrative & Policy Diagnostic

PROCEED-the second 4 phases

Phase 6-Implementation

Phase 7-Process Evaluation

Phase 8-Impact Evaluation

Phase 9-Outcome Evaluation

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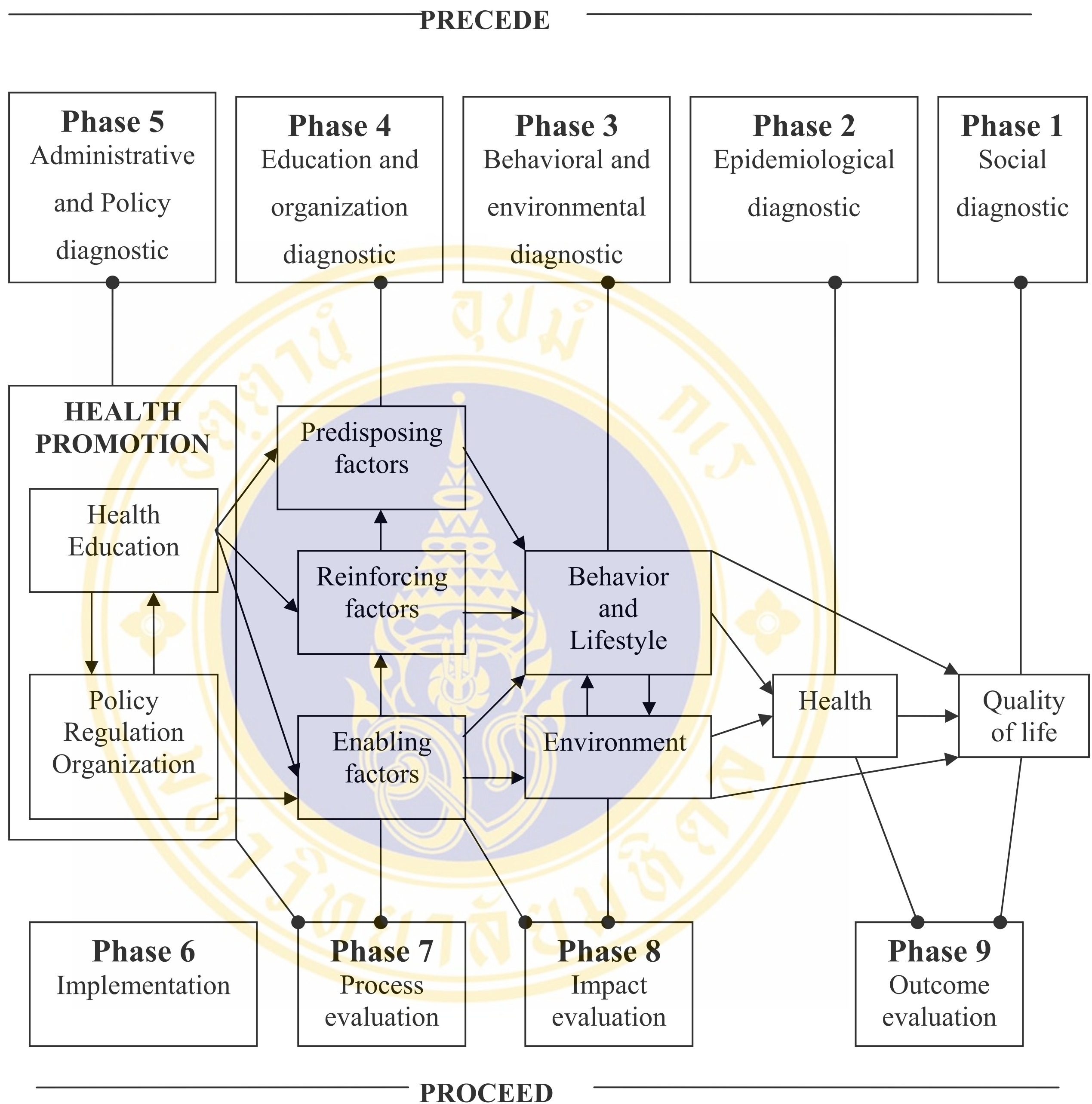

Figure 2 The PRECEDE-PROCEED model for Health Promotion Planning and Evaluation (18)

Phase 1-Social Diagnosis

The focus of this phase is to identify and evaluate the social problems, which impact the quality of life of a target population. This requires planners to gain an understanding of the social problems, which affects the quality of life of the patient,

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consumer, student, or community, as those populations see those problems. This is followed by the establishment of a link between these problems and specific health problems, which may become the focus of health education. The link is essential in life and, in turn, how the quality of life affects social problems (18).

Phase 2-Epidemiological Diagnosis

This phase helps determine health issues associated with the quality of life. It helps identify behavioral and environmental factors related to the quality of life issues. The focus of this phase is to identify specific health problem and non-health factors which are associated with a poor quality of life. Describing these health problems can: 1) help establish relationships between health problems, other health conditions, and the quality of life; 2) lead to the setting of priorities which will guide the focus of program development and resources utilization; and 3) make possible the delineation of responsibilities between involved professionals and organizations and agencies. These priorities are defined as program objectives which define the target population (WHO), the desired outcome (WHAT), and HOW MUCH benefit the target population should benefit, and by WHEN that benefit should occur (18).

Phase 3-Behavioral and Environmental diagnosis

This phase focuses on the systematic identification of health practices and other factors, which seem to be linked to health problems defined in Phase 2. This includes non-behavioral causes (personal and environmental factors) that can contribute to health problems, but are not controlled by behavior. These could include genetic predisposition, age, gender, existing disease, climate, and workplace, the adequacy of health care facilities, etc. Also assessed are the behaviors, which cause health problems in the target population. Another important component of this phase is the determination of the importance and relative changeability of each behavioral cause. It is critical that a behavioral diagnosis is completed for each health problem identified on Phase 2. This will allow all the planners to choose target behaviors, which will become the focus of specific educational interventions (18).

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Phase 4-Educational diagnosis

This phase assesses the causes of health behaviors, which were identified in Phase 3. Three kinds of causes are identified-predisposing factors, enabling factors, and reinforcing factors. The critical element of this phase is the selection of the factors, which if modified, will be most likely to result in behavior change. This selection process includes identifying and sorting (positive and negative) these factors in appropriate category, prioritizing factors among categories, and prioritizing with categories. Prioritization of factors is based on relative importance and changeability. Learning objectives are then developed which focus on these selected factors. Pinpoints the factors that must be changed to initiate and maintain behavioral change. It is during this phase that specific intervention objectives are created and the intervention itself will be implemented. Educational and organizational diagnosis looks at the specifics that hinder or promote behaviors related to the health issue (18).

Predisposing Factors-any characteristics of a person or population that motivates behavior prior to the occurrence of that behavior

- Knowledge
- Beliefs
- Values
- Attitudes

Enablers-characteristic of the environment that facilitate action and any skill or resource required to attain specific behavior

- Accessibility
- Availability
- Skills
- Laws (local, state, federal)

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Reinforces-rewards or punishments following or anticipated as a consequence of a behavior. They serve to strengthen the motivation for behavior.

- Family
- Peers
- Teacher.

Phase 5–Administrative and Policy diagnosis

This phase focuses on the administrative and organizational concerns, which must be addresses prior to program implementation. This includes the assessment of resources, budget development and allocation, development of an implementation timetable, organization or personnel within programs, and coordination of the program with all other departments, and institutional organizations and the community (18).

Phase 6-Implementation of the program

Phase 7-Process Evaluation

This phase is used to evaluate the process by which the program is being implemented (18).

Phase 8-Impact Evaluation

This phase measures the program effectiveness in terms of intermediate objectives and changes in predisposing, enabling, and reinforcing factors (18).

Phase 9-Outcome Evaluation

This phase measures change in terms of overall objectives and changes in health and social benefits or the quality of life. It takes a very long time to get results and it may take years before an actual change in the quality of life is seen (18).

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PRECEDE is an acronym for **P**redisposing, **R**einforcing, **E**nabling, **C**auses in, **E**ducational **D**iagnosis and **E**valuation.

PROCEED is an acronym for **P**olicy, **R**egulatory, **O**rganizational **C**onstructs in **E**ducational and **E**nvironmental **D**evelopment.

The four remain phases in PRECEDE-PROCEED model are implementation and evaluation (process, impact, and outcome), with emphasis on using the later to improve the former. Evaluation of the process begins as soon as implementation does, in order to detect problems early so they can be corrected. As implementation proceeds, the planer starts evaluating in the order in which program effects are expected (17).

Theory is most likely to be informative during phase 4 of the planning process suggested by PRECEDE-PROCEED model, or the educational and organizational diagnosis. This phase examines those behavioral and environmental condition linked to health status or quality of life concerns to determine what cause them. The educational and organizational diagnostic identifies factors that must be changed. These factors will become the immediate targets or objectives of the program (17).

2.5 Studies relating to the new antenatal care protocol

The researchers of WHO undertook a multicentre randomised controlled trial that compared the standard model of antenatal care with a new model that emphasises actions known to be effective in improving maternal or neonatal outcomes and has fewer clinic visits. They found that the groups had similar rates of low birth weight, the rate of eclampsia/preeclampsia was slightly higher in the new model Women and providers in both groups were, in general, satisfied with the care received, although some women assigned the new model expressed concern about the timing of visits. There was no cost increase, and in some settings the new model decreased cost. Provision of routine antenatal care by the new model seems not to affect maternal and

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perinatal outcomes. It could be implemented without major resistance from women and providers and may reduce cost (24).

A study of the implications for the introduction of the focused antenatal care model in Tanzania showed that the average time health workers currently spend for providing ANC service to a first visit client was found to be 15 minutes; the provision of ANC according to the focused ANC model was assessed to be 46 minutes. For a revisiting client the difference between current practice and the anticipated standard of the new model was 27 minutes (9 vs. 36 min.). The major discrepancy between the two procedures was related to counseling. On average a first visit client was counseled for 1:30 minutes, while counseling in revisiting clients did hardly take place at all. The simulation of focused ANC revealed that proper counseling would take about 15 minutes per visit (19).

A study of Clement S and his co-operators was conducted in 1999 to see if reducing the frequency of routine antenatal visits has any long-term effects on mother and her baby. They found that there was no evidence of differences between the two groups for any of the outcomes examined. Offering a reduced schedule of routine antenatal visits to low risk women does not appear to have any long-term effects (20).

In 2003, Louise Silverton, Deputy General Secretary of the Royal College of Midwives, said: "It is vital that the pattern of antenatal care is reviewed to become more effective by focusing on quality and assessing what care women receive. This subsequently allows women to make a more informed choice regarding the care they receive."(21). On the article of National Childbirth Trust (NCT) in October 22th, 2003 the National Collaborating Centre for Women and Children Health (NCCWCH) for the National Institute for Clinical Excellence developing a new evidence-based clinical guiline on rountine antenatal care said that women with uncomplicated pregnancies should receive fewer antenatal appointments.

In 1989, the US Public Health Service Expert Panel on Prenatal Care recommended that the number of visits for low risk patients be reduced and become

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more "goal-oriented". Several studies have been done to validate these recommendations measuring outcomes such as patient satisfaction, cost savings, and the rates of low birth weight infants, preterm deliveries, cesarean deliveries, and preeclampsia. One study demonstrated that prenatal care visits could be reduced with no documented change in perinatal outcome or patient satisfaction. Other studies show that the frequency of prenatal visits can be significantly reduced (10.8 to 8.6) with no change in perinatal outcomes but with less satisfaction with care. One study of patients seen mainly by certified nurse midwives showed a significantly higher level of satisfaction with the reduced-visit prenatal care program. Prenatal care in developing countries has been shown to be adequate with as few as 4 prenatal visits. Finally, a systematic review published in the Cochrane database concluded that a reduction in the number of antenatal visits with an increased emphasis on the content with regard to services offered at each of the visits could be implemented without an increase in adverse perinatal outcomes (22).

A study of Munira N and Munjanja published in May 1997 about the effect of a new antenatal care program on the attitudes of pregnant women and midwives towards antenatal care in Harare, Zimbabwe, measured the satisfaction of pregnant women and staff with ANC, reasons for lack of satisfaction, and time spent waiting for consultations. They found that the new program did not make any impact on the time spent by women waiting to be seen at the clinics, nor on the time made available for the consultations. There was no significant impact on the degree of satisfaction with the care among the women. In the control clinics, significantly more staff wished the women to make fewer visits, and in the study clinics, significantly more staff thought the use of appointments was appropriate. The major problem limiting access to ANC was lack of money to pay for the booking fees. Other problems mentioned by the women were ignorance regarding the best time to book, lack of privacy and insufficient staff at the clinics. So, we can see that both women and health providers appreciate the new protocol (23).

In 2001, Jose Villar et al searched the Cochrane Pregnancy and Childbirth Group trials registered, articles and found that a reduction in the number of antenatal visits

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was not associated with an increase in any of the negative maternal and perinatal outcomes reviewed. Antenatal care provided by a midwife/general practitioner was associated with improved perception of care by women. Clinical effectiveness of midwife/general practitioner managed care was similar to that of obstetrician/gynecologist led shared care (25).

To investigate the impact of an alternative prenatal care program for low-risk patients, Binstock conducted a research in 1995 and found that there were no significant pregnancy outcome differences between the groups. The alternative antenatal care program reduced the number of antenatal visits by 27% and was not associated with any change in maternal or perinatal outcomes. Patient satisfaction parameters were either maintained or improved with alternative prenatal care. The study concluded that an alternative prenatal care program for low-risk patients reduced resource utilization without adversely affecting prenatal care process variables, pregnancy outcome or patient satisfaction (26).

Jewell D, Sharp D conducted a study of flexibility in routine antenatal care, they found that there was no difference in the proportions of women reporting antenatal problems as soon as possible in flexible groups compared to the traditional group, which encouraged women to adopt a flexible approach to antenatal care which resulted in a similar finding compared to the conventional protocol (30).

2.6 The comparison between the new World Health Organization antenatal care protocol and the conventional protocol in Thailand

The new ANC protocol (9)	The conventional ANC protocol	Note
- Only four visits during a pregnancy for normal healthy pregnant women	- At least 13 visits during a pregnancy for all pregnant women	**- Different**
- Appointment: first visit (before 12wks), second visit (26wks), third visit (32wks), fourth visit (38wks)	- Appointment: <= 28wks, every four wks; after 28wks, every two wks; after 36wks, every one wks until giving birth	**- Different**

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The new ANC protocol (9)	The conventional ANC protocol	Note
First visit: (emphasis on occurring before week 12 of pregnancy), if later than 12wks, carry out all activities up to that time.	**First visit**: (no mention about emphasis on occurring before 12wks of pregnancy)	**- Different**
- Use classifying form, which indicates eligibility for basic component of the new protocol with 18 items. If yes of any one of questions means that the woman is not eligible and need to be transfer to the conventional one	- Risk assessment in the MCH book with 20 items. If yes of any one of questions means that the women should be referred to secondary or tertiary care units or under the obstetricians' care	**- Different**
- Obtain information on: - Personal history: housing, sanitary conditions, education, income - Medical history - Obstetric history	- Obtain information on: - Illnesses of family members - The same - The same	**- Different**
- Perform physical examination: - Signs of severe anemia, Hb test if there are signs of severe anemia, Blood group - Weight, Height, Blood pressure, chest & heart auscultation - Vaginal examination - No oral check	- Perform physical examination - Full blood examination - The same - Not specify - Oral check	**- Different** **- Different** **- Different**
- Perform the following test: - Urine: multiple dipstick test for bacteria and test for proteinuria - Measure uterine height - Blood: syphilis by rapid test and treat at once if the result is (+)	- Perform the following test: - Urine test for Sugar and Albumin - The same - Syphilis but the result and treatment will be received in the	**- Different** **- Different**

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The new ANC protocol (9)	The conventional ANC protocol	Note
	next visit	
- Assess for referral - Determine the expected date of delivery based on last menstrual period or relevant information - Medical problem about: Diabetes, Heart disease, renal disease, epilepsy, drug abuse, severe anemia, HIV (+), abnormal obstetric history, hypertension, abnormal BMI, if (+)-> refer if cannot treat - Ultrasound is not mentioned	- Assess for referral - The same - The same - Use ultrasound	**- Different**
- Intervention - Iron and acid folic supplementation - Tetanus toxoid - Treat malaria if in endemic area - Refer high risk case - Pap smear if not have within 2 years	- Intervention - Mostly, Iron and multivitamin - The same - The same - The same - Not specify	**- Different** **- Different**
- Give advice on safe sex, stop using alcohol and tobacco, breast-feeding, whom to call and where to go in case of emergencies (bleeding, abdominal pain…), birth plan. - Request the women to record when she notes the first fetal movement	- The same - The same	
<u>Second visit:</u> (26 wks) - Record symptoms and events since	**<u>The visits of 16wks, 20wks, 24wks, 28wks</u>** - The same	

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The new ANC protocol (9)	The conventional ANC protocol	Note
first visit (pain, bleeding, vaginal discharge: amniotic fluid?)		
- Clinical examination for anemia, oedema	- The same	
- Check for twins or pathological condition with unexpected large uterus	- The same	
- Blood pressure taken	- The same	
- Maternal weight (only for women with low weight at first visits)	- Maternal weight for every women	**- Different**
- Repeat urine test for bacteria if (+) in the first visit, urine test for protein (only for nulliparous women/women with previous pre-eclampsia)	- Not specify	**- Different**
- Fe/Folic acid supplementation given	- Fe and multivitamin supplementation	**- Different**
- Repeat Hb test if the test in the first visit Hb<70g/l	- The same	
- Give advice on whom to call and where to go in case of emergencies (vaginal bleeding, abdominal pain…)	- The same	
- Request the women to record when she notes the first fetal movement	- The same	
- After that, if fetal movement/fetal heart rate (-)->refer	- The same	
- Recommendation for emergencies	- The same	
Third visit: (around 32 wks) All of the steps in 2nd visit and - Hemoglobin test requested - Tetanus toxoid (second dose) - Instructions for delivery/plan for	**Visits of 30wks, 32wks, 34wks, 36wks** - The same activities as the former visits	

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The new ANC protocol (9)	The conventional ANC protocol	Note
birth - Providing instruction and advice in the event of labor start, whom to call and where to go - Recommendations for lactation/contraception		
Fourth visit: (around 38 wks) All of the steps in 3rd visit and - Detection of breech presentation and referral for external cephalic version - Give advice if the women have not delivered by the end of the 41st week - Reconfirm information on whom to call and where to go - Schedule appointment for postpartum visit	**Visits of 37wks, 38wks, 39wks, 40wks** - Ultrasound will be used in case of suspicion of breech presentation, if (+)->C-Section - The same - The same - The same	**-Different**

***Note:**

- Available evidence from many researches of WHO demonstrates that the new protocol is unlikely to jeopardize pregnant women's health or that of their fetuses.
- Timing and spacing between the visits in the new protocol were decided empirically based upon the results of the WHO antenatal care RCT.
- This new ANC protocol is being implemented in Khon Kaen province, Thailand.

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CHAPTER 3
RESEARCH METHODOLOGY

3.1 Study design

The study design was a cross sectional study. This study was conducted in all hospitals and health centers in Suphan Buri province, Thailand, with the objective to study the factors related to the acceptance of the new antenatal care protocol among the health personnel.

3.2 Study population and sample

Population was the health personnel who were working in ANC fields in all health delivery units in the central part of Thailand. There are 20 provinces in the central part. One province named Suphan Buri was purposely selected.

The sample in this research was the health personnel working in ANC field in all health delivery units in Suphan Buri province, Thailand. The health personnel were the ones who were directly responsible for taking care of the pregnant women.

3.3 Sample size

The sample size is calculated based on statistical formula as follow

$$n = \frac{z^2_{\alpha/2}p(1-p)}{d^2} = \frac{(1.96)^2 0.859(1-0.859)}{(0.06)^2} = 130$$

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where:

n=estimated sample size

z= level of significance is set on α=0.05, therefore z=1.96 (two sided test).

p= proportion of health personnel who feel satisfied with the new ANC protocol which is equal to 85.9%, therefore p=0.859 (27).

d= allowance for relative error = 0.06

The minimum samples size required at least 130 cases, while the total personnel who worked for antenatal care field at provincial hospital, district hospitals and health centers in Suphan Buri province were 182 persons. Therefore, all eligible health personnel were included.

3.4 Data collecting tools and methods

The data was colleted by using self-administered questionnaire with 55 questions, accompanied with the comparison form between the new antenatal care protocol and the conventional protocol. The questionnaire was divided into 7 parts:

Part 1: 12 questions about the attitude of the health personnel towards the new ANC protocol. The questions were close-ended by using the rating scale, with 3 choices. 8 questions were on the positive side, while the other 4 questions were on the negative side.

Part 2: 4 questions about the training on antenatal care. The questions were close-ended.

Part 3: 12 questions about the facility availability of hospitals and health centers. The questions were close-ended.

Part 4: 5 questions about the supporting policy towards the new ANC protocol. The questions were close-ended.

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Part 5: 5 questions about the peer opinions towards the new ANC protocol. The questions were close-ended.

Part 6: 10 questions about the acceptance of the new ANC protocol. The questions were close-ended. 8 questions were on the positive side, while the other 2 questions were on the negative side.

Part 7: 7 questions about the general information of the health personnel, such as age, professional background, working experience in ANC, number of health personnel in the ANC unit, number of cases per day, comments and suggestions for the new ANC protocol. The questions were close-ended and open-ended.

Before processing to the data collecting process, the questionnaire was submitted to thesis advisors in order to check the content validity. Then, it was translated into Thai version. Thirty sets of questionnaires were provided to the health personnel working in ANC unit in Bangkean maternal and child health promotion center in Bangkok, attached with the comparison form between the conventional ANC protocol with the new ANC protocol of World Health Organization, to check for reliability, before the final copy was drawn and used to collect the necessary data for this study.

Cronbach's alpha coefficient of the reliability was 0.92 for the attitude part and 0.81 for the acceptance part, respectively.

3.5 Data analysis procedure

3.5.1 Variables and scoring criteria

Twelve questions were on the attitude of the health personnel towards the new ANC protocol. Each question had three forms of answer: agree (3 point), not sure (2 point), disagree (1 point) for positive statements and vice versa for negative statements. With the total score 0-36, the attitude score was calculated for average score and divided the health personnel into 2 groups: positive attitude if the total score was equal or above mean and negative attitude if the total score was under mean.

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Four questions were on the training received on antenatal care. Each questions had two answers: yes (1 point), no (0 point). This variable divided the health personnel into 2 groups: good training if the total score was equal or above mean and poor training if the total score was under mean.

Twelve questions were about the facility availability of hospitals and health centers. Each question had two answers: yes (1 point), no (0 points). This variable divided ANC units into 2 groups: good facility availability if the total score was equal or above mean and poor facility availability if the total score was under mean.

Five questions were about the supporting policy towards the new ANC protocol. Each question had 2 answers: yes (1 point) and no (0 point). This variable divided the hospitals into 2 groups: good supporting policy if the total score was equal or above mean and poor supporting policy if the total score was under mean.

Five questions were about the peer opinions towards the new ANC protocol. Each question had 2 answers: yes (1 points) and no (0 point). Each statement in this part was described according to the percentage of "yes" answer and "no" answer.

Ten questions were about the acceptance of the new ANC protocol among health personnel. Each question had two answers: yes (1 point), no (0 point) for positive statements and vice versa for negative statements. The total score was 0-10 points. This variable divided the health personnel into 2 groups: acceptor if the total score was equal or above mean and non-acceptor if the total score was under mean.

3.5.2 Statistical methods

Descriptive Statistics such as frequency, percentage, mean and standard deviation were calculated to explain about the general information of the health personnel, the attitude towards the new antenatal care protocol, the training on ANC, the facility availability of the hospitals and health centers, the supporting towards the new ANC protocol, the peer opinions and the acceptance of the new ANC protocol.

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Inferential Statistics:

- Pearson's Product Moment Correlation and Chi-Square test were used to ascertain the significance in the association between independent variables and the acceptance of the new ANC protocol among the health personnel.
- The Multiple Regression Analysis was used to analyze the variables that could predict the acceptance of the new ANC protocol among the health personnel. The Stepwise procedure was used to select the significant independent variables.

The Stepwise multiple regression analysis had to be inspected in the basic conditions, in this study, it was found that:

1. The professional background of the health personnel was a nominal variable. Therefore, prior to the analysis, it was necessary to transform this variable into the following two dummy variables: Nurses were references
   - Midwife: 1 if Midwife, 0 for others
   - Community health personnel: 1 if Community health personnel, 0 for others.
2. In the use of multiple regression, the relationship among the independent variables should be associated in a low level, as considered from the VIF (Variance Inflation Factor) value being less than 5 and the Tolerance value should not be close to zero. In this study, it was found that there was a low level of association among the independent variables. The VIF value was between 1.000-1.341 and the Tolerance value was between 0.746-1.000, which was close to 1; therefore, it could be considered that multicollinearity would not occur.
3. When inspected, it was found that there was not any autocorrelation phenomenon, by considering from the Dubin-Watson value in this study, which was 1.88 (close to 2), indicating that this phenomenon would never happen.

The Level of Significance had been determined to be at 0.05.

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CHAPTER 4
RESULTS

This cross-sectional study was conducted on the acceptance of the new antenatal care protocol among the health personnel in Suphan Buri province, who worked in the antenatal care units in all hospitals and health centers in the province. A total of 182 self-administered questionnaires were provided and collected from 7th to 29th of January 2007. There were some missing data in 3 questionnaires, so the data obtained from 179 questionnaires were used for data analysis.

The research results have been tabulated and presented in frequency and percentage. The association between the independent variables and the acceptance of the new ANC protocol among the health personnel was statistically determined, using Pearson's Product Moment Correlation, Chi-Square test and Multiple regression analysis with the level of significance at $\alpha = 0.05$. The independent variables found to be significantly associated with the acceptance of the new antenatal care protocol were further analyzed for identifying factors significantly affecting the acceptance of the new ANC protocol, using Stepwise Procedure. The result was presented in the following 5 parts:

Part 1: The personal characteristics of the health personnel

Part 2: The acceptance of the new ANC protocol among the health personnel

Part 3: The attitude towards the new ANC protocol, the training on ANC, the facility availability, the supporting policy towards the new ANC protocol and the peer opinions towards the new ANC protocol

Part 4: The association between the predisposing factors (age, professional background, attitude towards the new ANC protocol), the enabling factors (years of experience in ANC services, staff and client ratio, training on ANC, facility availability), reinforcing factors (supporting policy towards the new ANC protocol, peer opinions) and the acceptance of the new ANC protocol among the health personnel

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Part 5: The analysis for the factors that could predict the acceptance of the new ANC protocol among health personnel

Part 1 The personal characteristics of the health personnel

Table 1 Number and percentage of the general information of the health personnel

General information	Number	Percent
Age (year)		
< 30	23	12.9
30-45	123	68.7
>45	33	18.4
Min = 21 Max = 59 Median = 40	Mean = 38.7	S.D = 8.1
Professional background		
Nurse	81	45.2
Midwife	30	16.8
Community health personnel	68	38.0
Years experience in ANC		
<10	49	27.4
10-20	92	51.4
>20	38	21.2
Min = 1 Max = 35 Median = 13	Mean = 13.9	S.D = 8.2
Client and staff ratio		
<10	166	92.7
≥10	13	7.3
Min = 0.7 Max = 20 Median = 1	Mean = 1.8	S.D = 3.3

Table 1 shows the personal characteristics of the health personnel. It was found that the majority of the health personnel belonged to the age group 30-45 (68.7%).

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The average age was equal to 38.7 years old with standard deviation of 8.1. The youngest was 21 years old and the oldest was 59 years old, respectively.

Regarding the professional background, nearly half of the health personnel were nurses (45.2%), while one-third of them were community health personnel (38%) and the left (16.8%) were midwives.

The average amount of years working in antenatal care field was 13.9 years. Almost half of the health personnel worked for 10-20 years in ANC field.

The result revealed that 92.7% was the client and staff ratio less than 10 clients per 1 health personnel, only 7.3% was the ratio between 10 and 20, with the average ratio equal to 1.8, and the minimum ratio was 0.7 (three health personnel with 2 cases per day) and the maximum ratio was 20.

Part 2 The acceptance of the new antenatal care protocol among the health personnel

Table 2 Number and percentage of the acceptor and non-acceptor of the new antenatal care protocol among the health personnel

Health personnel			**Number n = 179**	**Percent (%)**
Acceptors			124	69.3
Non-acceptors			55	30.7
Min = 0	Max = 10	Median = 9	Mean = 7.9	S.D = 2.5

Results regarding the acceptance of the new antenatal care protocol among the health personnel in Table 2 revealed that the health personnel had the average score of the acceptance of the new ANC protocol equal to 7.9. When the acceptance of the new ANC protocol was divided into two groups: acceptors and non-acceptor, with

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concerning to the criteria, which were equal or above mean and less than mean, the result revealed that 69.3% of health personnel accepted the new antenatal care protocol while 30.7% of them did not accept it.

When concerning specifically to the acceptance of the new antenatal care protocol among the health personnel, it was found that 92.7% of the health personnel were willing to join training course about this new protocol, and 94.4% of them wanted to find more information about this new protocol. Likewise, about half of the health personnel (50.4%) were worried about the spacing time between visits, as shown in Table 12 in Appendix B.

Part 3 The attitude towards the new ANC protocol, the training on ANC, the facility availability, the supporting policy and the peer opinions towards the new ANC protocol

3.1 The attitude towards the new antenatal care protocol

Table 3 Number and percentage of the attitude of the health personnel towards the new ANC protocol

Attitude			**Number**	**Percent**
Positive attitude (≥Mean)			104	58.1
Negative attitude (<Mean)			75	41.9
Min = 14	Max = 36	Median = 31	Mean = 29.5	S.D = 5.7

The attitude towards the new antenatal care protocol was divided into two groups as positive attitude and negative attitude, with concerning to the criteria, which were equal or above mean and less than mean. As shown in Table 3, the average score of the attitude towards the new ANC protocol was 29.5 with the standard deviation of 5.7. Fifty eight percent of the health personnel had positive attitude towards the new

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ANC protocol, while 41.9% had negative attitude. The minimum of attitude score was 14 and the maximum was 36.

When each of the attitudes towards the new ANC was further examined, it was found that 79.3% of the health personnel agreed that the new protocol would reduce their workload, and 77% of them agreed that when they had pregnant relatives or friends, they would encourage them to use the new protocol. In addition, 74.8% of them agreed that coming to health clinic four times during on normal healthy pregnancy was adequate, and 82.7% of them agreed that they would tell their fellow about the advantage of the new protocol. Furthermore, 69.7% of the health personnel also agreed that this new protocol was appropriate for their clinics, and 70% of them agreed that when they had the right to decide which protocol to be implemented, they would choose the new protocol, as shown in Table 13 in Appendix B.

3.2 The training received on antenatal care

Table 4 Number and percentage of the training received on antenatal care of the health personnel

Training received			**Number**	**Percent**
Good (≥Mean)			115	64.3
Poor (<Mean)			64	35.3
Min = 0	Max = 4	Median = 3	Mean = 2.5	S.D = 1.3

Table 4 shows that the health personnel working in antenatal field had the average score in training received on ANC equal to 2.5. The training received on ANC was divided into two groups: good training received and poor training received, with concerning to the criteria, which were higher or equal to mean and less than mean. It was found that 64.3% of health personnel had good training received and the left had poor training received, with the minimum of training received score was 0 and the maximum of that was 4.

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When each of the training received on antenatal care was further examined, it was found that more than 90% of the health personnel joined the meeting about maternal and child health; likewise, only 29.6% of the health personnel working in health clinics that opened antenatal care training class for staff, as shown in Table 14 in Appendix B.

3.3 The facility availability in hospitals/health centers

Table 5 Number and percentage of the facility availability in hospitals/health centers

Facility availability			Number	Percent
Good (≥Mean)			78	43.6
Poor (<Mean)			101	56.4
Min = 1	Max = 12	Median = 7	Mean = 7.0	S.D = 2.7

Regarding the facility availability of antenatal care in hospitals and health centers, it was found that the health clinics had the average score of the facility availability equal to 7 with the standard deviation 2.7. When the facility availability was divided into two groups: good facility availability and poor facility availability, with concerning to the criteria, which were higher or equal to mean and less than mean, it was found that more than half of health clinics had poor facility availability (56.4%) and the left had good facility availability, as shown in Table 5.

When each of the facility availability of antenatal care was further examined, it was found that only 28.5% of health personnel working for health clinics that had the possibility to have multiple-dipstick test, when 19.6% of the health personnel working for health clinics that had the possibility to have rapid test for syphilis, and only 17.9% the health personnel working for health clinics that had the possibility to have test for blood group typing (ABO and Rhesus). However, 89.4% of the health personnel working for the health clinics that had the possibility to have tetanus toxoid

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and 100% of the health clinics had the possibility to have referral system, as shown in Table 16 in Appendix B.

3.4 The supporting policy towards the new antenatal care protocol

Table 6 Number and percentage of the supporting policy towards the new ANC protocol

Supporting policy			Number	Percent
Good (≥Mean)			93	52.0
Poor (<Mean)			86	48.0
Min = 0	Max = 5	Median = 5	Mean = 4.0	S.D = 1.4

The research result revealed that the health clinics had the average score in the supporting policy equal to 4.03 with standard deviation 1.36. When the supporting policy was divided into 2 groups: good supporting policy and poor supporting policy, by concerning the criteria, which were higher or equal to mean and less than mean, it was found that the health clinics that had good supporting policy were nearly the same compared with the health clinics that had poor supporting policy (52% vs. 48%), as shown in Table 6.

When each of the supporting policy was further examined, it was found that 91% of the health personnel working for health clinics that would allow all ANC personnel to be trained to practice the new protocol, and 86.6% of health personnel working for health clinics that would encourage the ANC personnel to practice the new protocol, as shown in Table 15 in Appendix B.

3.5 The peer opinion towards the new antenatal care protocol

When each of statement in the peer opinions was examined, it was found that 19.6% of the health personnel were told about this new protocol and 80.4% of them

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were not told about this new protocol by their friends. About 12.9% of the health personnel were told about the advantages of the new protocol while 87% of the health personnel did not know about the advantages of this protocol from their friends. Nearly 94% of the health personnel did not know about the disadvantages of this protocol. Further, almost all of the health personnel (98.9%) did not know that Khon Kean province put this new protocol into practice. Lastly, 11.2% of the health personnel heard about this protocol from their fellow while 88.8% of them did not hear about it, as shown in Table 7.

Table7 Percentage of each statement in the peer opinions towards the new antenatal care protocol

Peer opinions	**Percent**	
	Yes	**No**
1. Do your friends tell you about this new protocol?	19.6	80.4
2. Do your friends tell you about the advantages of the new protocol?	12.9	87.1
3. Do your friends tell you about the disadvantages of the standard protocol?	6.2	93.8
4. Do your friends tell you that Khon Kean province put this new protocol into practice?	1.1	98.9
5. Do you hear your fellow in other clinics tell about the new protocol?	11.2	88.8

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Part 4 The association between the predisposing factors (age, professional background, attitude towards the new ANC protocol), the enabling factors (years of experience in ANC services, client and staff ratio, training received on ANC, facility availability), reinforcing factors (supporting policy towards the new ANC protocol, peer opinions) and the acceptance of the new ANC protocol among health personnel

Table 8 Correlation coefficient between the predisposing factors, the enabling factors (except the professional background), the reinforcing factors and the acceptance of the new ANC protocol among health personnel

Factors	**The acceptance of the new ANC protocol**	
	r	**P-value**
Predisposing factors		
- Age	-0.018	0.810
- Attitude towards the new ANC protocol	0.749	<0.001**
Enabling factors		
- Years of experience in ANC services	0.055	0.467
- Client and staff ratio	-0.064	0.400
- Training received on ANC	0.177	0.017*
- Facility availability	0.223	0.030*
Reinforcing factors		
- Supporting policy towards ANC protocol	0.532	<0.001**
- Peer opinion	0.205	0.006*

** Significant at $\alpha = 0.01$

* Significant at $\alpha = 0.05$

All of the factors in the conceptual framework were used in the calculation for the association with the acceptance of the new ANC protocol among health personnel.

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Pearson's Product Moment Correlation and Chi-Square test were the statistical methods used to ascertain the bivariate correlation between the each independent variable and dependent variable. The multiple regression analysis was used to test the actual relationship between the independent variables and dependent variable. The research revealed the following results

Age

By using Pearson correlation analysis, the result revealed that there was no significant association identified between age of health personnel and the acceptance of the new ANC protocol, elucidating no matter how old the health personnel were, that had no impact on the acceptance of the new ANC protocol, as shown in Table 8.

Professional background

Table 9 Association between the professional background and the acceptance of the new antenatal care protocol among the health personnel

Professional background	Acceptors N = 124		Non-acceptors N = 55		P-value
	n	%	n	%	
Nurse	58	71.6	23	28.4	0.26
Midwife	17	56.7	13	43.3	
Community health Personnel	49	72.1	19	27.9	

By using Chi-Square test, the result revealed that there was no significant association identified between professional background of the health personnel and the acceptance of the new ANC protocol, elucidating that no matter what professional background of the health personnel were, that had no impact on the acceptance of the new ANC protocol, as shown in Table 9.

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Attitude towards the new ANC protocol

By using Pearson correlation, the result revealed that there was a positively significant association identified between the attitude towards the new ANC protocol and the acceptance of the new ANC protocol among health personnel (P-value < 0.001). It was found that the association between the attitude towards the new ANC protocol and the acceptance of the new ANC protocol had the same direction. The health personnel, who had a positive attitude towards the new ANC protocol, were likely to accept the new ANC protocol. This relationship was quite high (r = 0.749), as shown in Table 8.

Years of experience in ANC service

By using Pearson correlation analysis, the result revealed that there was no association between years of experience in ANC service of the health personnel and the acceptance of the new ANC protocol, elucidating no matter how long the health personnel were working in antenatal field, that had no impact on the acceptance of the new ANC, as shown in Table 8.

Client and staff ratio

By using Pearson correlation analysis, the result revealed that there was no association between the client-staff ratio of the health personnel and the acceptance of the new ANC protocol, elucidating no matter how much the client-staff ratio were, that had no impact on the acceptance of the new ANC, as shown in Table 8.

Training received on ANC

By using Pearson correlation analysis, the result revealed that there was a positively significant association between the training the health personnel received on antenatal care and the acceptance of the new ANC protocol (P-value = 0.017). It could be elaborated that the association between the training the health personnel received on ANC and the acceptance of the new ANC protocol had the same direction. The health personnel, who received more training, had the tendency to accept the new ANC protocol, as shown in Table 8.

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Facility availability

By using Pearson correlation analysis, the result revealed that there was a positively significant association between facility availability in health clinics and the acceptance of the new ANC protocol among health personnel (P-value = 0.03). It was unequivocally established that the association between the facility availability and the acceptance of the new ANC protocol among health personnel had the same direction. The health personnel, who were working in health clinics that had good facility availability, were likely to accept the new antenatal care protocol, however, the strength of the association was not so high (r = 0.223) when compared with the association between the attitude towards the new ANC protocol and the acceptance among the health (r = 0.749), as shown in Table 8.

Supporting policy towards the new ANC protocol

By using Pearson correlation analysis, the result revealed that there was a positively significant association between supporting policy and the acceptance of the new ANC protocol among health personnel (P-value < 0.001). It was elucidated that the association between the supporting policy and the acceptance of the new ANC protocol had the same direction. The health personnel, who were working in health clinics that had good supporting policy, had the tendency to accept the new ANC protocol; in addition, the association was fairly high (r = 0.532), as shown in Table 8.

Peer opinions

By using Pearson correlation analysis, the result revealed that there was a positively significant association between peer opinions towards the new ANC protocol and the acceptance of the new ANC protocol among health personnel (P-value = 0.006). It indicated that the association between the peer opinions and the acceptance of the new ANC protocol had the same direction. The health personnel, who had high peer opinions, were likely to accept the new ANC protocol, however, the association was not so high (r = 0.205), as shown in Table 8.

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Table 10 Multiple regression analysis between factors and the acceptance of the new ANC protocol among health personnel

Factors	**b**	**S.E.(b)**	**beta**	**t**	**P-value**
Age	-0.017	0.023	-0.055	-762	0.447
Professional background					
Midwife	-0.552	0.339	-0.83	-1.631	0.105
Community health personnel -	0.250	0.259	-0.049	-0.963	0.337
Attitude towards the new ANC protocol	0.292	0.022	0.662	13.153	<0.001**
Years of experience in ANC services	0.004	0.022	0.012	0.167	0.868
Client and staff ratio	0.029	0.041	0.039	0.708	0.48
Training received on ANC	-0.018	0.093	-0.009	-0.192	0.848
Facility availability	0.104	0.053	0.111	1.952	0.053
Supporting policy	0.413	0.099	0.225	4.181	<0.001**
Peer opinion	0.218	0.108	0.95	2.021	0.045*
$R^2 = 0.66$	$R^2adj = 0.64$	S.E = 1.5			N = 179

**Significant at $\alpha = 0.01$

* Significant at $\alpha = 0.05$

When all of the independent variables were included in the Multiple regression analysis, it was found that there were actual associations between the attitude towards the new antenatal care protocol (P-value < 0.001), the supporting policy (P-value < 0.001), the peer opinions (P-value = 0.045) and the acceptance of the new antenatal care protocol among the health personnel. In addition, the result revealed that the regression model having attitude towards the new antenatal care protocol, supporting policy and the peer opinions could explain the change of the acceptance of the new antenatal care protocol among health personnel fairly high (R^2 = 64%), as shown in Table 10.

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Part 5 The analysis for the factors that could predict the acceptance of the new ANC protocol among health personnel by Stepwise multiple regression analysis

Table 11 Stepwise multiple regression analysis between factors and the acceptance of the new ANC protocol among health personnel

Factors	**b**	**S.E.(b)**	**beta**	**t**	**P-value**
Attitude towards the new ANC protocol	0.286	0.022	0.65	13.164	<0.001**
Supporting policy	0.397	0.96	0.216	4.144	<0.001**
Facility availability	0.117	0.44	0.124	2.663	0.008**
Peer opinion	0.233	0.105	0.102	2.205	0.029*
$R^2 = 0.805$	$R^2adj = 0.648$		S.E = 1.498		N = 179

** Significant at $\alpha = 0.01$

* Significant at $\alpha = 0.05$

Multiple regression analysis using Stepwise procedure was used to select the independent variables which were statistically significant determinants to predict the acceptance of the new ANC protocol among health personnel. The most significant factor came first and followed by the consecutive ones, the actual factors remaining showed significance. All of the factors including age, professional background, attitude towards the new ANC protocol, years of experience in ANC services, client-staff ratio, training received on ANC, facility availability, supporting policy and the peer opinions had been used in the analysis.

Result from the analysis demonstrated in Table 11 indicated that when controlling the effects of other independent variables in the model, the attitude towards the new ANC protocol was found to be a statistically significant predictor of the acceptance of the new ANC protocol among health personnel (P-value < 0.001).

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Therefore, the health personnel, whose attitude towards the new antenatal care protocol were higher 1 point, were more likely to have their score of acceptance increasing by 0.286 point (b = 0.268).

Stepwise multiple regression further identified another determinant to be statistically significant predictor of the acceptance of the new antenatal care protocol, which was supporting policy (P-value < 0.001). It could be elucidated that when controlling the effects of other independent variables in the model, with every 1 point increased in score of the supporting policy, the acceptance of the new antenatal care protocol increased by 0.397 point (b = 0.397), as shown in Table 11.

The facility availability was also found to be a statistically significant determinant of the acceptance of the new antenatal care protocol (P-value = 0.008). It could be elucidated that when controlling the effects of other independent variables in the model, it was found that the health personnel whose facility availability in their health clinics increased 1point tended to have their score of acceptance of the new antenatal care protocol increasing by 0.117 point (b = 0.117), as shown in Table 11.

The peer opinions was the last determinant to be found significant associated with the acceptance of the new antenatal care protocol (P-value = 0.029). When the effects of other independent variables were controlled in the model, it was found that the health personnel whose peer opinions was increased 1 point had the tendency to have their score of acceptance increasing by 0.233 point (b = 0.233), as shown in Table 11.

The research result revealed that the regression model having four factors: attitude towards the new antenatal care protocol, supporting policy, the facility availability and the peer opinions could explain the change of the acceptance of the new antenatal care protocol among the health personnel quite high (R^2 = 64.8%), as shown in Table 11.

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CHAPTER 5
DISCUSSION

This cross-sectional study was conducted to determine the factors related to the acceptance of the new antenatal care among health personnel in Suphan Buri province, using self-administered questionnaires accompanied with a comparison form between the new antenatal care protocol of World Health Organization and the conventional one. A total of 179 questionnaires with complete information were collected and analyzed. It is unequivocal from the result of WHO trials that there were no significant differences between the new and standard model of antenatal care in terms of severe anemia, pre-eclampsia, urinary-tract infections or low birth weight infants. There were no significant differences in secondary outcomes for either women or infants, and models of antenatal care involving fewer visits could be introduced without risk to mothers or babies and could reduce healthcare costs. Therefore, this study would be very beneficial in considering to introduce the new protocol into practice in this province as well as nationwide in order to reduce workload, release hospital staff and buildings for other uses, increase quality of antenatal care and save money.

The results obtained from the study were highlighted in details in this chapter. The consequence of discussion composed of 5 parts was presented according to following important issues:

Part 1: The acceptance of the new antenatal care among health personnel in Suphan Buri province

Part 2: The association between the predisposing factors (age, professional background, attitude towards the new ANC protocol) and the acceptance of the new ANC protocol among health personnel

Part 3: The association between the enabling factors (years of experience in ANC services, client and staff ratio, training received on ANC, facility availability) and the acceptance of the new ANC protocol among health personnel

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Part 4: The association between the reinforcing factors (supporting policy towards the new ANC protocol, peer opinions) and the acceptance of the new ANC protocol among health personnel

Part 5: The analysis of the factors that related to the acceptance of the new antenatal care protocol by Stepwise multiple regression

Part 1 The acceptance of the new antenatal care among health personnel in Suphan Buri province

The result of this study unveiled that more than two third of the health personnel (69.3%) accepted the new antenatal care protocol while the left (30.3%) did not accept the new protocol (Table 2). The health personnel would be willing to practice this new protocol in their clinics, they were willing to join training course about this new protocol, they wanted to find more information about this protocol and they appreciated it. The reason for this might be that all health personnel worked at public health institutions, where the number of visits does not have a serious impact on their income and also because they considered the cost effectiveness of the new protocol which reduced the number of visits but provided the same maternal and child health outcomes (27). In the Sikorski J. trial (29), doctors were in favor of a reduced number of visits, but the average number under routine circumstances was higher than in the four countries that participated in the WHO trial. Similar results were obtained in the study conducted in public hospitals in Harare, where the assessment showed that staff wished women made fewer visits to ANC clinics (23), suggesting that the adoption of the new antenatal care protocol would not face major obstacles derived from health personnel's perception of antenatal care and their satisfaction with it. However, they were worried about the spacing time between visits. This finding was remarkably consistent with the result of the randomized control trials carried out by researcher from World Health Organization (6). The health personnel that did not accept the new antenatal care protocol might be due to the fact that this protocol was too new to them, they lacked of information and knowledge about this protocol, that was the first time they knew about it, and they only got information about it from the comparison form provided, in addition, they did not have chance to practice it. Furthermore, they

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got used to the conventional protocol that included 13 visits per pregnancy, which was practiced a long time ago. So, they were in doubt about the safety for the pregnant women in the new protocol which included only 4 visits during the pregnant time. This resulted to the discontent of the new antenatal care protocol.

Part 2 The association between the predisposing factors (age, professional background, attitude towards the new ANC protocol) and the acceptance of the new ANC protocol among health personnel

Age

The finding of this study showed that there was no significant association identified between age of health personnel and the acceptance of the new ANC protocol, as shown in Table 8. This was contrary to the hypothesis. This might be explained by some intrinsic factors that the new antenatal care protocol was so new to the health personnel, except some of them who knew about this new protocol from their friends before, most of them the first time knew about it when they received the comparison form, in addition, they had not had chance to practice it before, resulting in a very little difference in the acceptance of those who were young or old. The studies on the acceptance of the antenatal care were so rare, so other studies were implied. The result of this study was consistent with the study by Karakes C. (31), which found that there was no association between age and the health personnel competency in development promotion of children 0-5 years old, because the performance on development promotion in children was still new among health personnel and not widely practiced. This research finding was also consistent with the study carried out by Sivametheekul P (32), finding that age had no effect on the ability in health consumer protection of sub-district health personnel since there was little performance on the activities in health consumer protection.

Professional background

The study revealed that there was no significant association identified between professional background of health personnel and the acceptance of the new antenatal care protocol, as shown in Table 9. This result was found not to be compatible with

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the hypothesis. The rationale behind this finding could be elucidated that the health personnel had the same routine activities and responsibility in antenatal care with the pregnant women no matter what professional background they had. Serving in antenatal field required specific skills which all health personnel provided care for pregnant women ought to have. In the past, they had different educational levels and different trainings, but in the current time, they performed the same specific services everyday no matter who they were: nurse, midwife or community health personnel. Moreover, the health personnel had no chance to practice the new antenatal care protocol before. This finding perfectly confirmed the result from the study of Karakes C. (31), stating that educational levels had no impact on the competency in promoting child development since the competency in promoting child development required practice in order to acquire specific skills in some of activities.

Attitude towards the new ANC protocol

According to study results regarding the attitude of the health personnel towards the new antenatal care protocol, it was unveiled that there was a positively significant association identified between the attitude towards the new antenatal protocol and the acceptance of the new ANC protocol among health personnel (P-value < 0.001), by using Pearson correlation, as shown in Table 8. When other variables were controlled by using multiple regression analysis to test the association, it was also found that there was a significant association between the attitude towards the new antenatal care protocol and the acceptance of the new antenatal care protocol among health personnel, elucidating that the association the relationship between the attitude towards the new antenatal care protocol and the acceptance of the new antenatal care protocol among health personnel was indeed true. In addition, the attitude towards the new antenatal care protocol had a rather high level of association with the acceptance among health personnel (r-value = 0.749), resulting in the ability to use the attitude in explanation for the acceptance of the new antenatal care among health personnel, which was compatible with the hypothesis. It could be explained that when the health personnel acquired the information about the new antenatal care protocol as well as the advantages of it from the comparison form provided, they might feel that this new protocol would be appropriate for their clinic (68.7%), they could believe that coming

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to health clinics four times during a normal pregnancy was adequate but still safe for pregnant women (74.8%). In addition, they agreed that they would tell their fellow about the advantage of the new protocol (82.7%) and they also agreed that when they had the right to decide which protocol to be implemented, they would choose the new one (70%). This finding was in corresponded with the study conducted by Villar J. and Bergsjo P. (9), who found that the health personnel were satisfied with the number of visits of the new antenatal care protocol per pregnancy and did not have strong views against it. And the research result was also consistent with the study carried out by Munira N. et al (23), who found that the midwives thought the use of appointments in the new antenatal care protocol was appropriate.

Part 3 The association between the enabling factors (years of experience in antenatal care services, client and staff ratio, training received on ANC, facility availability) and the acceptance of the new ANC protocol among health personnel

Years of experience in antenatal care services

As for years of experience in antenatal care services, it was found that there was no significant association identified between years on experience in antenatal care services of health personnel and the acceptance of the new ANC protocol, as shown in Table 8. This was contrary to the hypothesis. It could be explained that the health personnel had no chance to practice this new protocol before, leading to very little differences among health personnel no matter how long they had been working in antenatal care services. Moreover, this protocol was quite new to them and it included only four visits per pregnant time, it required expertise in accomplishment, so the health personnel might be still in doubt about the safety for pregnant women because all of the information about this new protocol came mostly from the comparison form, not from experimental practice. This finding was consistent with the result from the study conducted by Karakes C. (31), stating that there was no association between civil service years and the competency in promoting child development, since the practice on development promotion in children was still new and some activities required knowledge and skills. This finding was also consistent with the result from

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the study of Srisarakam P. (32), who found that the civil services years had no effect on the management ability of the health personnel in communicable disease prevention and control because according to the work characteristics of communicable disease prevention and control, some activities required expertise in performance.

Client and staff ratio

Regarding the client and staff ratio, the result revealed that there was no significant association identified between client-staff ratio and the acceptance of the new ANC protocol, as shown in Table 8. This finding was contrary to the hypothesis. It could be elucidated that 92.7% of the client-staff ratio was less than 10 clients per 1 personnel, which was meant they did not cope with the workload. The adequacy of the number of the health personnel compared to the vast amount of work might be appropriate. The health personnel had enough time to take care of the pregnant women coming to their health clinics. This finding was correlated with the result from the study of Vongsumpunchai A. (33), which stated that the number of health personnel that supported maternal and child health care had no association with the performance on maternal and child health care of the sub-district health personnel.

Training received on ANC

According to the study's result, it was found that there was a positively significant association between the training the health personnel received on antenatal care and the acceptance of the new ANC protocol (P-value = 0.017), as shown in Table 8. When testing the association using multiple regression analysis, it was found that training received on ANC had no association with the acceptance of the new antenatal care protocol, elucidating that the relationship between the training received on antenatal care and the acceptance of the new antenatal care was weak. The training received had a low level of association with the acceptance of the new antenatal care protocol (r = 0.177), resulting in the inability to use training received in the explanation for the acceptance of the new antenatal care protocol. It could be explained that the training that the health personnel received might be about general training about antenatal care, but they did not receive any training about the new

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antenatal care protocol. This finding was not consistent with the result of Marjolein D (35), who found that training had impact on the job motivation of health workers, because when they were trained, they felt confident to perform their job.

Facility availability

The research result revealed that there was a positively significant association identified between the facility availability and the acceptance of the new ANC protocol among health personnel (P-value = 0.03) by using Pearson correlation, as shown in Table 8. When other variables were controlled by using multiple regression analysis to test the association, it was found that facility availability had no impact on the acceptance of the new antenatal care protocol, elucidating that the relationship between the facility availability and the acceptance of the new antenatal care was weak, and the level of association was not so high (r = 0.223). Meanwhile, 28.5% of health personnel working in health clinics that had the possibility to have multiple-dipstick test, when 19.6% of them working in health clinics that had the possibility to have rapid test for syphilis, and only 17.9% of them working in health clinics that had the possibility to have test for blood group typing (ABO and Rhesus). It could be explained that the new antenatal care protocol required special tests which were multiple dipstick test and syphilis rapid test and blood group typing. It was very difficult for the health clinics to have such those kinds of specific tests when they were still implementing the conventional protocol. This finding was compatible with the result from the study of Vongsumpunchai A. (33), who found that the equipment supporting maternal and child health care had no association with the performance on maternal and child care of sub-district health personnel. Nonetheless, the finding was different from the result from the study of Khuntakasikum K. (36), who found that the sufficiency of equipment had an association with the ability in managing the development process of the health centers by the health center chiefs in the service area, since the services at the health centers required sufficient number of equipment in order to perform the services efficiently and qualitatively.

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Part 4 The association between the reinforcing factors (supporting policy towards the new ANC protocol, peer opinions) and the acceptance of the new ANC protocol among health personnel

Supporting policy

According to study results regarding the supporting policy, it was unveiled that there was a positively significant association between supporting policy towards the new ANC protocol and the acceptance of the new ANC protocol among health personnel (P-value < 0.001) by using Pearson correlation, as shown in Table 8. When other variables were controlled by using multiple regression analysis to test the association, it was also found that the supporting policy had an impact on the acceptance of the new antenatal care among health personnel (P-value < 0.001), as shown in Table 10, elucidating that the association between the supporting policy and the acceptance of the new antenatal care protocol among health personnel was indeed true. In addition, supporting policy had a rather high level of association with the acceptance among health personnel (r = 0.532), resulting in the ability to use the supporting policy in explanation for the acceptance of the new antenatal care among health personnel, which was compatible with the hypothesis. It could be explained that when the health personnel were working in health clinics that had policy supporting for their work, they would have high confidence and enthusiasm and would be more willing to accept new protocol. In fact, when the policy in their health clinics did not have tendency to support their job, there might be a decrease of their fervent, they would not want to make any changes and keep on the same boring routine of their work. When the supporting policy was considered in each area, it was found that 91% of health personnel working in health clinics that would allow all ANC personnel to be trained to practice the new protocol, and 86.6% of them working in health clinics that would encourage the ANC personnel to practice the new protocol. This noteworthy sign gave some suggestions for the policy makers about implementing the new protocol accompanied with promulgating supporting policy to commit the health personnel on working dedicatedly. Supporting policy was also some kind of motivating factors that motivate the health personnel in their work. This finding was correlated with the result from the study of Karakes C. (31), who found

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that the motivating factors in working had the association with the competency in promoting child development, since when the health personnel had motivating factors in working, more interest would be given to their work. The same as the findings from the study of Rattanasam N. (37), stating that the motivating factors had a positive association with the performance on the sub-district health personnel, because the human behaviors occurred only when there was motivation.

Peer opinions

As for the peer opinions, it was found that there was a positively significant association between peer opinions towards the new ANC protocol and the acceptance of the new ANC protocol among health personnel (P-value = 0.006), as shown in Table 8. When other variables were controlled by using multiple regression analysis to test the association, it was also found that the peer opinions had an association with the acceptance of the new antenatal care among health personnel (P-value < 0.001), as shown in Table 10, elucidating that the association between the peer opinions and the acceptance of the new antenatal care protocol among health personnel was strong. It was unequivocal that the peer opinions had an impact on the acceptance of the new antenatal care protocol. It could be explained that the health personnel acquired the information as well as the advantages of the new antenatal care protocol from their friends, their fellows that made them have the tendency to accept this protocol. In addition, this new protocol with only four visits during pregnant time, which was proven to be unlikely to jeopardize pregnant women's health or that of their fetuses, motivated the health personnel to accept it when they again got the information. This finding was consistent with the result from the study of Champers S. (38), who found that peer opinions influenced on cognitive restructuring and peer interactions and the type of peer interactions led to the type of view change.

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Part 5 The analysis of the factors that related to the acceptance of the new antenatal care protocol among health personnel by using Stepwise multiple regression

According to the study's results regarding the factors related to the acceptance of the new antenatal care protocol among health personnel, by using Stepwise multiple regression, it was unveiled that there were four factors: attitude towards the new ANC protocol, the supporting policy, the facility availability and the peer opinions that could predict the change the acceptance of the new ANC protocol among health personnel in Suphan Buri province up to 64.8%, as shown in Table 11. This finding was considerably noteworthy that when the policy makers concerned about the implementation of the new antenatal care protocol, they should paid more attention to the four factors mentioned above.

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CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The world health organization randomized trial of antenatal care and the world health organization systematic review indicated that a model of care that provided fewer antenatal visits could be introduced into clinical practice without causing adverse consequences to the woman or the fetus. This new model of antenatal care is being implemented mainly in Khon Kaen province, Thailand. Action has been required at all levels of the health-care system, from consumers through to health professionals, the Ministry of Public Health and international organizations. This experience is a good example of moving research findings into practice, and it should be replicated elsewhere to effectively manage other health problems. This research with the objective of determination the factors related to the acceptance of the new antenatal care protocol among health personnel in Suphan Buri province, Thailand could join forces as part of concerted efforts for consideration of implementing the new protocol in this province as well as nationwide.

The self-administered questionnaires were used as the data collecting tool and method in this cross-sectional study. Data were collected from January 7th to January 29th among 179 health personnel working in antenatal care field in all of hospitals and health centers in Suphan Buri province. The questionnaire was previously tested for reliability at Bangkean maternal and child health promotion center in Bangkok. Cronbach's alpha coefficient of the reliability was 0.92 for the attitude part and 0.81 for the acceptance part, respectively. Univariate analysis (mean, standard deviation, frequency, and percentage) was employed to provide description in the descriptive part of the study. Chi-Square test and Pearson's Product Moment Correlation were used to assess the significant association between each independent variable of interest and the acceptance of the new antenatal care protocol among health personnel. Multiple regression analysis and Stepwise procedure were further employed to evaluate the magnitude of the association and the predictive power of

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independent variables previously found significant with the acceptance of the new antenatal care protocol.

The result showed that the average age of among 179 health personnel working in antenatal care field in Suphan Buri province was equal to 38.7 years old with the standard deviation of 8.1. The youngest was 21 and the oldest was 59. Most respondents were middle-aged with the age range from 30 to 45 (68.7%). Most of them were nurses and community health personnel (45.2% and 38%).

Half of the health personnel had been working in antenatal field for 10-20 years. More than 90% of them had the client-staff ratio less than 10 with the minimum ratio of 0.67 (three health personnel with 2 clients) and the maximum of 20 with the standard deviation of 3.3. The large ratio was mainly in hospitals.

Concerning all of the above variables (age, professional background, years experience in antenatal field and client-staff ratio), it was found that no variables above had the association with the acceptance of the new antenatal care protocol among the health personnel.

As for the acceptance of the new antenatal care protocol among health personnel, it was found that 63.9% of the health personnel accepted the new antenatal care protocol, while 30.7% left did not accept it. Basically, the health personnel accepted the new antenatal care protocol. The result shows that the new antenatal care protocol was well accepted by the health personnel, suggesting that the adoption of the new antenatal care model would not face major obstacles derived health personnel's perception of antenatal care and their satisfaction with it When concerning the issues that the health personnel had low score, it was found that 40.9% of the health personnel agreed that they were worried about the spacing time between visits, and 34% of them said that this new protocol was not possible to practice in their health clinics.

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Regarding the attitude towards the new antenatal care protocol among health personnel, the majority of the health personnel (58%) had positive attitude towards the new antenatal care protocol. They agreed that the new protocol would reduce their workload; in addition, they agreed that coming to health clinic four times during a normal healthy pregnancy was adequate. It was unveiled that the attitude towards the new antenatal care protocol had a positively significant association with the acceptance among the health personnel (P-value < 0.001, r = 0.749).

Concerning the training that the health personnel received on antenatal care, it was unveiled that 64.3% of the health personnel had good training. It was also found that the training received on antenatal care had no association with the acceptance of the new protocol among the health personnel.

As for the facility availability in health clinics, it was unequivocal that more than half of the health personnel working in health clinics that had poor facility availability (56.4%), however the left had good facility availability (43.6%). When the facility availability was considered in each area, it was unveiled that 28.5% of the health personnel working in health clinics that had the possibility to have multiple-dipstick test, 19.6% of them working in health clinics that had the possibility to have rapid test for syphilis, and only 17.9% of them working in health clinics that had the possibility to have test for blood group typing (ABO and Rhesus). The facility availability was found to have significant association with the acceptance of the new antenatal care protocol (P-value < 0.001, r = 0.223).

In the supporting policy towards the new antenatal care protocol, it was found that the health personnel working in the health clinics that had the good supporting policy and the poor supporting policy were nearly equal to each other (52% and 48%). 91% of health personnel working in health clinics that would allow all antenatal care personnel to be trained to practice the new protocol, and 86.6% of them working in health clinics that would encourage the ANC personnel to practice the new protocol. It was also found that the supporting policy had positively significant association with the acceptance of the new antenatal care protocol (P-value < 0.001, r = 0.532).

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As for the peer opinions, it was found that 80.4% of the health personnel were not told about this new protocol by their friends, 87% of the health personnel did not know about the advantages of this protocol from their friends. Nearly 94% of the health personnel did not know about the disadvantages of this protocol. Further, almost all of the health personnel (98.9%) did not know that Khon Kaen province put this new protocol into practice, and 88.8% of them did not hear about it. It was found that peer opinions had a significant association with the acceptance of the new antenatal care protocol (P-value = 0.006, r = 0.205).

When the Stepwise multiple regression analysis was used, it was found that four factors: attitude towards the new antenatal care protocol, the supporting policy, the facility availability and the peer opinions had the actual association with the acceptance of the new antenatal care protocol. The regression model with these four factors could explain the change of the acceptance of the new antenatal care protocol among health personnel fairly high (R^2 = 64.8%).

6.2 Recommendation

Recommendation for the administrators

1. Regarding the significant association between the attitude towards the new ANC protocol and the acceptance of this new protocol among the health personnel, it is recommended that the administrators should have programs that promote the new ANC protocol such as providing conferences, meetings, and trainings about the new antenatal care protocol to give the health personnel chances to be exposed to this new protocol. From the result, it was found that 94.4% of the health personnel would like to find more information about this new protocol, so it is very advantageous to provide the health personnel information of this new protocol When the health personnel get more information, they can have knowledge, they know the advantages of this protocol and then gradually increase their positive attitude towards it as well as change from negative attitude into positive attitude towards this new protocol.

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2. Concerning the significant association between the supporting policy, the facility availability and the acceptance of the new ANC protocol, it is recommended that the administrators should visit Khon Kean province to have a clear view of the real practice of the new protocol, to see how effective this protocol is in practical aspect and in economical aspect as well. The pregnant women can be provided with good quality of care, pay less money and do not need to wait for her turn in a so long time. With this real situation, the administrators can have considerations in improving supports in policy as well as facility in their health clinics, which will have positive effects on the acceptance of the new protocol among the health personnel.

3. With the significant association between the peer opinions and the acceptance of the new ANC protocol, it is highly recommended that experts about the new protocol from Khon Kean and from WHO should be invited to give lectures as well as trainings about the new ANC to help the health personnel increase the peer opinions towards the new protocol. Group discussion among the health personnel in other provinces and the ones in Khon Kean province should be organized in conferences, meetings about the new protocol in order to exchange experiences about the conventional protocol and the new one.
4. The result revealed that 50% of the health personnel were worried about the spacing time between visits and more than 60% of them thought that this new protocol was not possible to practice in their clinics. It is recommended that information about available evidence from many researches of WHO demonstrates that the new protocol is unlikely to jeopardize pregnant women's health or that of their fetuses the should be provided to change the health personnel' mind. And through conferences, meetings, the administrators as well as the health personnel should know that timing and spacing between the visits in the new protocol were decided empirically based upon the results of the WHO antenatal care.

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Recommendation for future study

1. Qualitative method such as depth-interview should be applied for further study to acquire the complete factors related to the acceptance and the satisfaction of the new antenatal care protocol among the health personnel and the administrators.
2. Further studies should be designed to explore the factors related to the satisfaction and dissatisfaction of the conventional antenatal care protocol among health personnel and pregnant women.
3. An experimental study of the new protocol and the conventional one is highly recommended to provide evidence-based information for health personnel and to acquire the essential information for the implementation of the new protocol.

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APPENDIX

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APPENDIX A
QUESTIONNAIRE

Please read the comparison between the new WHO ANC protocol and the conventional one before answering this questionnaire. You only need to spend your 10 minutes to finish this questionnaire. This questionnaire is for research purpose and your answers will be kept completely confidential and not exposed to other purpose.

Background information:

Name:…………………………………………

Hospital/Health center:……………………………………………………………………

Date of answer questionnaire:………………………..

Attitude towards the new ANC protocol

Please tick (√) in the appropriate box to mark your answers

No.	**What do you feel or think?**	Agree	Not sure	Disagree
1	This new protocol is appropriate for your clinic.			
2	New protocol with four visits will reduce your workload.			
3	When you have a pregnant relative or friend, you will encourage her to use this new protocol.			
4	Coming to hospital/health center four times during a normal pregnancy is adequate.			
5	Your clinic shouldn't implement this new protocol because it is not safe for the pregnant women.			
6	It is difficult for you to check the health of the pregnant women with only four times during the pregnancy.			
7	Your hospital should change from the standard protocol to the new one.			

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No.	What do you feel or think?	Agree	Not sure	Disagree
8	When you have the right to decide which protocol to be implemented, you will choose the new one.			
9	You prefer the conventional protocol to the new one.			
10	The pregnant women will be satisfied with the care they receive with four visits in the new protocol.			
11	You will tell your fellow about the advantage of this new protocol.			
12	With only four visits, the new protocol provides fewer opportunities for health education and counseling.			

Training on ANC

13. Does your clinic often open ANC training class for staff?

□1. Yes

□2. No

14. Have you ever joined in class training about ANC?

□ 1. Yes

□ 2. No (skip to question 16)

15. If yes, can you improve your work after training class?

□1. Yes

□2. No

16. Have you ever joined any meeting about maternal and child health meeting?

□1. Yes

□2. No

Facility availability

No.	Facility availability	Yes	No
17	Is it possible to have multiple dipstick test (1) in your clinic?		
18	Is there test for proteinuria in your clinic?		

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19	Is there guideline for checking anemia in your clinic?		
20	Is it possible to have rapid test for syphilis (2) in your clinic?		
21	Is there iron and folate tablets in your clinic?		
22	Is there guideline for gestational diabetes in your clinic?		
23	Is there guideline for preeclampsia/eclampsia case in your clinic?		
24	Is there tetanus toxoid in your clinic?		
25	Is there any equipment for checking fetal heart rate in your clinic?		
26	Is there test for blood group typing (3) in your clinic?		
27	Is there guideline for checking oedema in your clinic?		
28	Is there referral system in your clinic?		

(1): test for detecting urinary-tract infection

(2): the result of syphilis will be received immediately after testing

(3): ABO and rhesus

Supporting policy towards the new ANC protocol

No.	Supporting policy	Yes	No
29	Your clinic will accept this new protocol.		
30	Your clinic will give financial support for new equipment.		
31	Your clinic will allow all ANC personnel to be trained to practice this new protocol.		
32	Your clinic center gives information about this new protocol.		
33	Your clinic will encourage ANC personnel to practice the new protocol.		

Peer opinions

34. Do your friends tell you about this new protocol?

□1. Yes

□2. No

35. Do your friends tell you about the advantages of the new protocol?

□1. Yes

□2. No

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36. Do your friends tell you about the disadvantages of the standard protocol?

□1. Yes

□2. No

37. Do your friends tell you that Khon Kaen province put this new protocol into practice?

□1. Yes

□2. No

38. Do you hear your fellow in other clinics tell about the new protocol?

□1. Yes

□2. No

Acceptance of the new ANC protocol

No.	**Acceptance of the new ANC protocol**	Yes	No
39	You want to practice this new protocol in your clinic.		
40	You are willing to join training course about this new protocol		
41	This new protocol should be implemented in all hospitals/health centers.		
42	You will recommend this new protocol to your relatives and friends.		
43	You are worried about the spacing time between visits.		
44	This new protocol is not adequate to use in your clinic		
45	You want to find more information about this new protocol		
46	The staffs working in ANC unit need to be trained about this new protocol.		
47	You appreciate this new protocol.		
48	You will suggest the policy makers in your clinic to consider putting this new protocol into practice.		

49. How old are you?………. years

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50. What is your professional background?

 1. Nurse

 2. Midwife

 3. Community health personnel

 4. Others (Please specify…………………………..)

51. How many years have you been working in ANC unit?………………years

52. How many personnel in your ANC unit?………….

53. How many cases per day in your ANC unit? ……………

54. Who is responsible for checking health for a normal healthy pregnant woman in your clinic?

 1. Nurse/Midwife

 2. Community health personnel

 3. Others (Please specify……………………………….)

55. General comments and suggestions for the new protocol:

……………………………………………………………………………………..

……………………………………………………………………………………..

……………………………………………………………………………………..

……………………………………………………………………………………..

……………………………………………………………………………………..

……………………………………………………………………………………..

Thank you for taking the time to complete this questionnaire!

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APPENDIX B

Table 12 Acceptance of the new antenatal care protocol among the health personnel

Health personnel	Percent	
	Yes	No
1. You want to practice this new protocol in your clinic	75.4	24.6
2. You are willing to join training course about this new protocol	92.7	7.3
3. This new protocol should be implemented in all hospitals/health centers	76.5	23.5
4. You will recommend this new protocol to your relatives and friends	85.0	15.0
5. You are worried about the spacing time between visits	50.3	49.7
6. This new protocol is not possible to practice in your clinic	65.9	34.1
7. You want to find more information about this new protocol	94.4	5.6
8. The staffs working in ANC unit need to be trained about this new protocol	89.4	10.6
9. You appreciate this new protocol	72.6	27.4
10. You will suggest the policy makers in your clinic to consider putting this new protocol into practice	80.4	19.6

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Table 13 The attitude of the health personnel towards the new antenatal care protocol

Attitude	Percent		
	Agree	**Not sure**	**Disagree**
1. This new protocol is appropriate for your clinic	68.7	18.4	12.9
2. New protocol with four visits will reduce your workload	79.3	9.5	11.2
3. When you have a pregnant relative or friend, you will encourage her to use this new protocol	77.1	5.6	7.3
4. Coming to hospital/health center four times during a normal pregnancy is adequate	74.8	14.0	11.2
5. Your clinic shouldn't implement this new protocol because it is not safe for the pregnant women	45.3	32.4	22.3
6. It is difficult for you to check the health of the pregnant women with only 4 times during the pregnancy	39.1	30.2	30.7
7. Your hospital should change from the standard protocol to the new one	l60.9	31.2	7.8
8. When you have the right to decide which protocol to be implemented, you will choose the new one	71.0	17.3	11.7
9. You prefer the conventional protocol to the new one	46.9	29.6	23.5
10. The pregnant women will be satisfied with the care they receive with four visits in the new protocol	38.0	56.4	5.6
11. You will tell your fellow about the advantage of this new protocol	82.7	14.5	2.8
12. With only four visits, the new protocol provides fewer opportunities for health education and counseling	40.8	31.3	27.9

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Table 14 Training received on antenatal care

Training received	**Percent**	
	Yes	**No**
1. Does your clinic often open ANC training class for staff?	29.6	70.4
2. Have you ever joined in class training about ANC?	64.3	35.7
3. If yes, can you improve your work after training class?	63.1	36.9
4. Have you ever joined any meeting about maternal and child health meeting?	92.2	7.8

Table 15 Supporting policy towards the new antenatal care protocol

Supporting policy	**Percent**	
	Yes	**No**
1. Your clinic will accept this new protocol	82.7	17.3
2. Your clinic will give financial support for new equipment	63.7	36.3
3. Your clinic will allow all ANC personnel to be trained to practice this new protocol	91.1	8.9
4. Your clinic center gives information about this new protocol	79.9	20.1
5. Your clinic will encourage ANC personnel to practice the new protocol	86.6	13.4

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Table 16 Facility availability in hospitals/health centers

Facility availability	**Percent**	
	Yes	**No**
1. Is it possible to have multiple dipstick test in your clinic?	28.5	71.5
2. Is there test for proteinuria in your clinic?	59.2	40.8
3. Is there guideline for checking anemia in your clinic?	64.2	35.8
4. Is it possible to have rapid test for syphilis in your clinic?	19.6	80.4
5. In there iron and folate tablets in your clinic?	55.9	44.1
6. Is there guideline for gestational diabetes in your clinic?	72.1	27.9
7. Is there guideline for preeclampsia/eclampsia case in your clinic?	56.4	43.6
8. Is there tetanus toxoid in your clinic?	89.4	10.6
9. Is there any equipment for checking fetal heart rate in your clinic?	74.3	25.7
10. Is there test for blood group typing in your clinic?	17.9	82.1
11. Is there guideline for checking oedema in your clinic?	58.7	41.3
12. Is there referral system in your clinic?	100	0

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APPENDIX C

CLASSSIFYING FORM

Criteria for classifying women for the basic component of the new ANC protocol

Name of patient…………………………………..…..Clinic record number
Address………………………………………………………Telephone…………...…...
INSTRUCTION: Answer all of the question by marking a cross mark in the correspondent box.

OBSTETRIC HISTORY	**No**	**Yes**
1. Previous stillbirth or neonatal loss?	☐	☐
2. History of 3 or more consecutive spontaneous abortion?	☐	☐
3. Birth weight of last baby < 2500gr?	☐	☐
4. Birth weight of last baby > 4500gr?	☐	☐
5. Last pregnancy: hospital admission for hypertension or pre-eclampsia/ eclampsia?	☐	☐
6. Previous surgery on reproductive tract? (Myomectomy, removal of septum, cone biopsy, classical CS, cervical cerclage)	☐	☐

CURRENT PREGNANCY	**No**	**Yes**
7. Diagnosed or suspected multiple pregnancy?	☐	☐
8. Age less than 16 years?	☐	☐
9. Age more than 40 years?	☐	☐
10. Isoimmunization Rh (-) in current or in previous pregnancy?	☐	☐
11. Vaginal bleeding?	☐	☐
12. Pelvic mass?	☐	☐
13. Diastolic blood pressure 90mm Hg or more at booking?	☐	☐

GENERAL MEDICAL		
14. Insulin-dependent diabetes mellitus?	☐	☐
15. Renal disease?	☐	☐
16. Cardiac disease?	☐	☐
17. Known ‘substance’ abuse (including heavy alcohol drinking)?	☐	☐
18. Any other severe medical disease or condition?	☐	☐

Please specify……………………………………………………………………………...
………………………………………………………………………………………………

A “Yes” to any ONE of the above questions means that the woman is not eligible for the basic component of the new antenatal care protocol model.
Is the woman eligible? (circle) NO YES
If NO, she is referred to ……………………………………………………………….
Date……………………Name…………….……………….Signature……………………..
(Staff responsible for ANC)

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BIOGRAPHY

NAME	Mrs. Trinh Tuyet Anh
DATE OF BIRTH	December 24, 1980
PLACE OF BIRTH	Ho Chi Minh City, Vietnam
INSTITUTION ATTENDED	Medical University of Ho Chi Minh City, Vietnam Doctor of Medicine 1998-2004
	ASEAN Institute for Health Development, Mahidol University, Thailand Master of Primary Health Care Management 2006-2007
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