EFFECTS OF MATERNAL HEALTH-SEEKING PRACTICES ON PREGNANCY OUTCOMES OF NULLIPAROUS ADOLESCENT AND ADULT MOTHERS IN KANCHANABURI DEMOGRAPHIC SURVEILLANCE SYSTEM, THAILAND

MYITZU TIN OUNG

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……..……..……
Ms. Myitzu Tin Oung
Candidate

……..……..……
Asst. Prof. Panee Vong-ek, Ph.D.
Major advisor

……..……..……
Assoc. Prof. Amara Soonthorndhada, Ph.D.
Co-advisor

……..……..……
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

……..……..……
Asst. Prof. Aree Jampaklay, Ph.D.
Chair
Master of Arts Program in Population and Reproductive Health Research
Institute for Population and Social Research
Mahidol University

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on
August 16, 2010

……..……..…..……
Ms. Myitzu Tin Oung
Candidate

……..……..…..……
Assoc. Prof. Uraiwan Kanungsukkasem, Ph.D.
Chair

……..……..…..……
Asst. Prof. Panee Vong-ek, Ph.D.
Member

……..……..…..……
Emeritus Prof. Suporn Koetsawang
M.D, Ph.D., F.R.C.O.G.
Member

……..……..…..……
Assoc. Prof. Amara Soonthorndhada, Ph.D.
Member

……..……..…..……
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

……..……..…..……
Assoc. Prof. Sureeporn Punpuing, Ph.D.
Director
Institute for Population and Social Research
Mahidol University

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MYITZU TIN OUNG 5238638 PRRH/M

M.A (POPULATION AND REPRODUCTIVE HEALTH RESEARCH)

THESIS ADVISORS: PANEE VONG-EK, Ph.D., AMARA SOONTHORNDHADA, Ph.D.

ABSTRACT

In adolescent pregnancies, there is still a debate about whether the risks are attributable to physiological factors, socio-economic factors, or health-seeking factors. This study aimed to investigate maternal health-seeking practices of nulliparous adolescent mothers compared with nulliparous adult mothers and determine effects of maternal health-seeking practices on their pregnancy outcomes. The data were derived from Survey of Pregnancy, Birth, and Early Life conducted in Kanchanaburi province, 2003. Nulliparous adolescent mothers aged 15-19 (n=117) and adult mothers aged 20-29 (n=193) who had delivered singleton live births within two years were included in the study.

Adolescent pregnancy rate in the study area represented 13.1% of all pregnancies. Adolescent mothers were significantly less likely to have had proper maternal health-seeking practices and more likely to experience adverse pregnancy outcomes than adult mothers. However, maternal health-seeking practices had no significant effect on pregnancy outcomes in both groups. Adolescent mothers had twice the risk of adverse pregnancy outcomes than adult mothers after controlling other variables. The results point out that adolescent pregnancy is a high risk pregnancy and prevention of adolescent pregnancy should be given a great priority.

KEYWORDS: ADOLESCENT MOTHERS/ ADULT MOTHERS/
PREGNANCY OUTCOMES/ HEALTH-SEEKING PRACTICES

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
GA	Gynecological age
ICPD	International Conference on Population and Development
KDSS	Kanchanaburi Demographic Surveillance System
LBW	Low Birth Weight
MMR	Maternal Mortality Ratio
MCH	Maternal and Child Health
SPBEL	Survey of Pregnancy, Birth, and Early Life
SGA	Small for Gestational Age
UNESCAP	United Nations Economic and Social Commission for Asia
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1 Problem Identification

Adolescent pregnancy has become a significant social and reproductive health concern in both developed and developing countries. Approximately 16 million women aged 15-19 give birth each year, accounting for about 11% of births worldwide. About 95% of these births occur in developing countries (WHO, 2008). Adolescent pregnancies and childbirths carry greater risks of morbidity and mortality for both mothers and babies. The risk of dying from pregnancy-related causes for adolescent mothers is two times higher than adult mothers (Rosen, 2004). Adolescent mothers are more likely to have preterm, low birth weight (LBW) and small-for-gestational-age (SGA) babies who are at higher risk of neonatal morbidity and mortality (Isaranurug, Mosuwan, & Choprapawan, 2006; Watcharaseranee, Pinchantra, & Piyaman, 2006; Raatikainen, Heiskanen, Verkasalo, & Heinonen, 2006; Chen et al., 2007).

The International Conference on Population and Development (ICPD) held in Cairo in 1994 gave special attention to adolescent sexual and reproductive health issues, and governments around the world were urged to address the special needs of adolescents and to establish appropriate programs to respond to their needs. However, gaps still remain in many countries. Reproductive health needs of adolescents, including maternal and child health, are different from those of adults. Lack of effective health programs designed for adolescents is a critical challenge for the improvement of adolescent reproductive health situations in many developing countries. The available information and services at health facilities are not specific for adolescents. In addition, there are judgmental attitudes, lack of knowledge and understanding of adolescent reproductive health, and lack of counseling skills among health providers (Barkat & Majid, 2003). These factors contribute to the

underutilization of health services by adolescent mothers, leading to adverse health consequences for themselves and their babies.

Utilization of quality antenatal and delivery care is critical to improve the outcomes of pregnancies through identifying risk factors and prevention and management of complications. However, in adolescent pregnancies, there is still a debate about whether the risks are attributable to physiological factors, socio-economic factors, or health-seeking factors. Some studies found that maternal age is an important independent risk factor for adverse pregnancy outcomes (Chen et al., 2007; Gupta, Kiran, & Bhal, 2008). On the other hand, adolescent mothers who attended high-quality maternity care had no extra risk for adverse pregnancy outcomes compared with adult mothers (Raatikainen et al., 2006; Young, Trotman & Thame, 2007). Use of timely and appropriate maternal health care can be a key proximate determinant of adolescent pregnancy outcomes. However, empirical evidence for the benefits of health care seeking is needed to add the existing body of knowledge.

1.2 Problem Justification

In Thailand, adolescent reproductive health problems, such as abortion, sexually transmitted infections, and unwanted pregnancy, are increasing as the current young generation is increasingly sexually active at earlier ages. Adolescent fertility in Thailand is relatively high. The Ninth National Economic and Social Development Plans set the target to reduce teenage pregnancy rate below 10% (Ministry of Public Health & WHO, 2003). However, adolescent pregnancy accounts for 16% of total pregnancy, which is the highest among ASEAN (Association of Southeast Asian Nations) countries (UNESCAP, 2008).

Regardless of whether the pregnancy is planned or unplanned, or whether childbirth takes place within or outside marriage, there are serious social and health consequences for adolescent girls and also for newborn babies. Thus, special attention for appropriate care is needed to minimize their risk of maternal and neonatal morbidity and mortality. To reduce maternal and child morbidity and mortality, several specific programs have been implemented in Thailand. Significant

improvements have been observed in the area of reproductive health including accessibility to reproductive health services over the last 10 years (UNFPA, 2005). However, adolescent mothers were less likely to use available maternal health services than adult mothers. Thus, they and their newborn babies were at high risks of serious health problems such as anemia, LBW, and preterm deliveries which are significant risk factors for neonatal morbidity and mortality (Watcharaseranee et al., 2006; Isaranurug et al., 2006; Thato, Rachukul, & Sopajaree, 2007; Kovavisarach, Chairaj, Tosang, Asavapiriyanont, & Chotigeat, 2010).

To improve adolescents' maternal and child health, their health care use and the impact of maternal health care on their pregnancy outcomes needs to be better understood by health program administrators. Such knowledge can assist them to tailor health programs to this needful group. This study investigated maternal health-seeking practices and their effects on pregnancy outcomes of nulliparous adolescent mothers compared with adult mothers.

1.3 Research Objectives

- **Ultimate objective**

To develop effective programs for adolescent mothers to improve their pregnancy outcomes by increasing utilization of maternal health services

- **Immediate objectives**

1. To describe maternal health-seeking practices of adolescent mothers during pregnancy and childbirth compared with adult mothers

2. To determine the effects of maternal health-seeking practices of adolescent and adult mothers on their pregnancy outcomes

CHAPTER II
LITERATURE REVIEW

In recent decades, adolescent pregnancy has become an important issue in both developed and developing countries including Thailand. It occurs in every country and every region, with varying outcomes. Its consequences affect health, social, psychological, and economic well-being of adolescent mothers, their babies, and society at large.

1.1 Adolescent pregnancy

Adolescent pregnancy is a complex issue, involving various factors such as socio-economic factors, biological factors, and health-seeking factors.

2.1.1 Socio-economic consequences of early pregnancy and childbirth

Early pregnancy and childbearing can bring social deprivation, lower educational attainment, and poverty. When pregnant girls are forced to leave school because of embarrassment, social expectation or physical demands of pregnancy and childbearing, they lose educational as well as employment opportunities (WHO, 2007). Together with lack of social and financial support, they are more likely to be unemployed, smoke (Gupta et al., 2008), use recreational drugs and alcohol, and have poor nutrition and emotional stresses (Thato et al., 2007). All these behavioral, social, and economic challenges make them vulnerable to encounter more difficulties during and after pregnancy.

2.1.2 Biological immaturity of young mothers

Not only social factors but also biological immaturity of young mothers influences on pregnancy outcomes. Low gynecological age (GA) (<2 years) has strong associations with delivering preterm and LBW babies. GA is defined as

"chronological age minus age at menarche", an indicator of biological maturity. It may be due to immature development of maternal organs, primarily their uterus and hypothalamic-pituitary axis. The higher the GA, the lower the risk of preterm delivery among adolescents is (WHO, 2004). Young age as well as low parity also increases the chance of cephalopelvic disproportion (disproportion between the head of baby and the mother's pelvis) which can cause serious labor complications and lead to adverse pregnancy outcomes (Miller, Lester, Webster, & Cowan, 2009). However, it remains controversial whether young maternal age is the independent risk factor for adverse pregnancy outcomes.

2.1.3 Adolescents' maternal health-seeking practices

Adolescent pregnancy is associated with a higher risk of adverse pregnancy outcomes and the risks become profound when adolescents fail to seek early antenatal care and receive appropriate management for obstetric complications from health providers (Thato et al., 2007). It seems to be important for young mothers to receive proper medical attention to enable early detection and management of risk factors and complications during pregnancy and childbirth.

Universal access to maternal health services has a critical role to improve maternal and child health (WHO, 2005). However, even in places where services are available, pregnant adolescents are reluctant to use reproductive health services including antenatal and delivery care. The possible reasons for their poor health-seeking behavior are inadequate reproductive health knowledge, lack of information, lack of financial resources, lack of social support, limited access to health services (WHO, 2006), judgmental attitudes and lack of knowledge of adolescent reproductive health among health providers (WHO, 2002).

The studies from Thailand showed that Thai pregnant adolescents had poorer health-seeking behavior than adults. A retrospective case control study which involved 1216 mothers (young women aged less than 20 years and adult women aged 20-34 years) who gave birth at a regional hospital in Bangkok from 2001 to 2003 revealed that, compared with adult mothers, adolescent mothers are significantly less likely to receive first antenatal visit in the first trimester of pregnancy (16% and 38.9%) and more likely to attend inadequate antenatal visits (27% and 9%) (Thato et

al., 2007). These findings are in accordance with the study conducted by Watcharaseranee et al. (2006). The study investigated primigravida women (2490 women aged 13-19 and 3909 women aged 20-25 years) who delivered their children at Chonburi Hospital from 2000 to 2005. They found that pregnant adolescents made fewer antenatal visits than pregnant adults (25.9% and 13.4%).

Reynolds, Wong & Tucker (2006) analyzed the Demographic and Health Survey data of 15 developing countries to examine the utilization of antenatal care and delivery care services by adolescent mothers compared with adult mothers. The study found that in three developing countries from Asia such as Bangladesh, Indonesia, and India, adolescent mothers (18 years and less) were significantly less likely to use skilled antenatal care (odds ratio (OR), 0.6-0.9) and skilled delivery care (OR, 0.5-0.8) than adult mothers (19-23years). Underutilization of maternal health care, together with social stigma related to premarital sexuality and early childbearing, make them more vulnerable to serious pregnancy outcomes than adults.

2.2. Factors affecting pregnancy outcomes

Babies born to adolescent mothers are at higher risks of preterm, LBW, other serious health problems, and death than babies born to adult mothers. They may experience serious repercussions in their newborn lives as well as in their adulthood. The pregnancy outcomes of interest in this study are preterm, LBW, and admission to hospitals.

2.2.1 Preterm

A baby born before the completion of 37 weeks of pregnancy is described as preterm. An estimated 13 million preterm babies are born each year worldwide. Advanced maternal age (≥35) and young maternal age (<20), prior history of preterm delivery, no prenatal care, low maternal weight (BMI<18.5 kg/m^2) (Ip, Peyman, Lohsoonthorn, & Williams, 2010), having employment (Watson-Jones et al., 2007), anemia (Lone, Qureshi, & Emmanuel, 2004; Bakhtiar, Khan, & Nasar, 2007) and smoking (Delpisheh, Attia, Drammond, & Brabin, 2006) were associated with

increased risk of preterm delivery. The significant factors related to preterm delivery among Thai pregnant mothers were history of preterm labor, pregnancy complications, no antenatal care (ANC) or less than four ANC visits, and unemployment (Visittipanich et al., 2003). Lao & Ho (2000) suggested that the rate of preterm delivery in adolescent pregnancies without major obstetric complications was significantly and inversely associated with maternal height. A World Health Organization review of adolescent pregnancy mentioned that obstetric complications during pregnancy, such as pre-eclampsia, serious fetal growth retardation, placenta praevia, and abruptio placentae may sometimes need to terminate pregnancy artificially before 37 completed weeks of gestation, and as a result the baby is born preterm (WHO, 2004).

Preterm birth is the direct leading cause of neonatal death (27% of neonatal deaths) in both developed and developing countries (Lawn et al., 2010). In addition, neonatal morbidity rate is double for preterm babies (Shapiro-Mendoza et al., 2008). They may face serious health problems, including LBW, breathing problems, life-threatening infections, and respiratory distress syndrome (RDS). Therefore, preterm delivery is also a significant risk factor (indirect cause) for neonatal mortality, especially due to infection. As long term disabilities, preterm babies carry a greater risk for cerebral palsy (CP) and a greater risk for learning difficulties and developmental impairment (Lawn et al., 2010).

2.2.2 Low Birth Weight (LBW)

Babies weighing less than 2500 grams are considered LBW. The incidence of LBW is 15 % per year worldwide, ranging from 6% to 30%. LBW is one of the main contributing factors to neonatal morbidity and mortality worldwide (WHO, 2006). Risk factors for LBW included untreated urinary tract and reproductive tract infections, low pre-pregnancy maternal weight, maternal height, low caloric intake and poor weight gain during pregnancy, low socioeconomic level (Torres-Arreola, Constantino-Casas, Flores-Hernandez, Villa-Barragan, & Rendon-Macias, 2005), anemia (Malhotra et al., 2002; Lone et al., 2004; Bakhtiar et al., 2007), working mothers, and primigravida (Watson-Jones et al., 2007). In addition, black maternal

race, marital status, and inadequate antenatal care were also associated with increased risk of LBW delivery (WHO, 2004).

A Multi-centered, case control study in Thailand found similar results, in which small maternal stature and weight, extreme maternal age (younger than 18 and older than 35), parity of one or greater than 4, pregnancy weight gain less than 10 kg, maternal obstetrical risk factors (e.g. vaginal bleeding during early pregnancy, maternal hypertension, convulsion during pregnancy), inadequate prenatal care, and cigarette smoking were significant maternal risk factors for LBW delivery (Chumnijarakij et al., 1992).

LBW babies were more likely to face grievous health problems during neonatal period than babies born with normal birth weight, such as respiratory distress syndrome, bleeding in the brain, and necrotizing enterocolitis. They often needed to be admitted to neonatal intensive care units (NICU). In addition to its short term consequences, they had higher risks for certain medical conditions in their adulthood like high blood pressure, type 2 diabetes mellitus, and heart disease.

2.2.3 Admission of babies to hospitals

Common neonatal morbidities requiring neonatal care and treatment at hospitals were neonatal infections, preterm, birth asphyxia, LBW, and neonatal jaundice (Parkash & Das, 2005; Rahim, Jan, Mohummad, & Iqbal, 2007). More than three-quarters of the world's neonatal deaths (87%) occurs due to neonatal infection, preterm and birth asphyxia (WHO, 2005).

A large proportion of perinatal and neonatal morbidity and mortality have resulted from obstetric complications that their mothers experienced during pregnancy and childbirth such as placenta previa, abruption placenta, and delivery complications (WHO, 1999). One hospital-based study in Thailand reported that babies who were born to mothers with specific obstetric complications such as severe pregnancy-induced hypertension, eclampsia, and thick meconium stain have the highest risk for neonatal illnesses which need intensive care or treatment at hospitals. Rural residence, extreme maternal age, primiparity, Islamic mothers, lower educational attainment, and strenuous occupation were also higher risks for neonatal morbidity in Thailand (Rachatapantanakorn, Tongkumchum, & McNeil, 2009).

As complications during pregnancy and delivery are strongly associated with neonatal health, appropriate maternal health care is critical to reduce neonatal morbidity and mortality by identifying and giving treatment obstetric complications. Low level of antenatal care and non-institutional delivery may lead to poor neonatal outcomes. A study from the US found that babies born to mothers who did not attend prenatal care had increased risk of respiratory distress syndrome, intraventricular hemorrhage, retinopathy, bronchopulmonary dysplasia and increased neonatal mortality (Herbst, Mercer, Beazley, Meyer, & Carr, 2003). Rahim et al. (2007) investigated outcomes of neonates who admitted to neonatal unit of Teaching Hospital in Pakistan. They found that most of the cases with infection admitted to neonatal unit were delivered at home by traditional birth attendants under unhygienic conditions and mothers of those babies had history of poor obstetric care.

2.3 Previous studies on adolescent pregnancy outcomes

Regarding outcomes of adolescent pregnancy, there are conflicting results among different studies. Many studies consistently reported that the incidence of adverse pregnancy outcomes among adolescent mothers, such as preterm, LBW, and neonatal morbidity was higher than the incidence among adult mothers and age was an independent risk factor for adverse outcomes. On the other hand, a few studies found that the outcomes of adolescent pregnancy had been improved if they took proper maternal health care during pregnancy and delivery.

Yadav et al. (2008) conducted a hospital-based, retrospective cohort study in Nepal, a developing country, in which he reported that teenage pregnancy (15-19 years) was associated with significant increased risk of preterm and LBW delivery compared with non-teenage pregnancy (20-29 years). Some hospital-based studies from Turkey, Jordan, and Saudi Arabia also found that adolescents had a higher incidence of preterm and LBW delivery than adult women (Imir et al., 2007; Keskinoglu et al., 2007; Al-Ramahi & Saleh, 2006; Abu-Heija, Ali, & Al-Dakheil, 2002); and babies born to adolescent girls were at a higher risk of neonatal intensive care unit admission (Al-Ramahi & Saleh, 2006). Studies from Thailand which

evaluated pregnancy outcomes of Thai adolescent women (Watcharaseranee et al., 2006; Isaranurug et al., 2006) gave similar results.

All those studies showed that adverse pregnancy outcomes were observed more frequently among adolescents than adults. However, these studies did not take into account some important determinants for preterm, LBW delivery, and neonatal morbidity, such as socioeconomic factors associated with young age (e.g. educational achievement, poverty), smoking, maternal weight, and history of antenatal care. They could not answer to what extent maternal health-seeking behavior contributed to the increased risk of adolescent pregnancy outcomes in their studies.

A study from the UK analyzed the outcomes of adolescent pregnancy by stratifying age into two groups as younger (17 years and less) and older adolescents (18 and 19 years). It was found that the incidence of both preterm and LBW was significantly higher among younger adolescent women compared with older women aged 20-34 years whereas only the incidence of preterm birth was significantly higher among older adolescent mothers after adjusting for smoking and some obstetric complications like multiple pregnancy, antepartum hemorrhage, pre-eclampsia, and premature rupture of membranes (Gupta et al., 2008).

Those findings are partly supported by the results of a population-based study in the United States. The study reported that all age groups (10-15 year, 16-17 year, and 18-19 year) of adolescent pregnancies were associated with excess risks of preterm, low birth weight and neonatal mortality compared with adults aged 20-24 years even after adjustment for important known confounders such as race, education, receiving maternal health care, weight gain during pregnancy, smoking, and alcohol use (Chen et al., 2007). This retrospective cohort study collected information based on birth certification data which may have missed or under-reported some important information of maternal risk factors, obstetric complications, and socioeconomic status. Both studies from the developed world showed that young maternal age was an intrinsic risk factor for adverse pregnancy outcomes.

A large, hospital-based, cross-sectional study from Latin America representing a population from developing countries provided similar results. They found that all age groups of adolescent mothers had a significantly higher risk than adult mothers aged 20 to 24 years of delivering preterm, LBW, and SGA babies after

eliminating the confounding influences of parity, education, geographic area, cigarette smoking, weight gain during pregnancy, history of antenatal care, and delivery place (Conde-Agudelo, Belizan, & Lammers, 2005). This study collected information from eighteen developing countries using Perinatal Information System database. The quality of data in this large database may have varied from different countries or regions. It may implicate the results of the study.

Conflicting results regarding outcomes of adolescent pregnancy can be observed from some other studies. Kongnyuy et al. (2008) reported that the risks of adverse maternal and neonatal outcomes among adolescent mothers were nearly two times higher than the adult mothers (20-29 years) in Cameroon (Odds ratios (OR) = 1.8, Confidence interval (CI) = 1.3-2.4 & OR = 1.8, CI = 1.4-2.4 respectively). However, it was found that unemployment and inadequate antenatal care were strongly associated with adverse neonatal outcomes than maternal age. Similarly, when Yoder et al. (1997) compared the neonatal outcomes among adolescent and adult mothers who had equal access to tertiary care centers, the findings showed that maternal age was not an independent risk factor for preterm and LBW delivery. Disadvantageous socioeconomic factors such as black maternal race, unmarried, lower socioeconomic status and inadequate maternal health care were the powerful determinants of adverse outcomes of adolescent pregnancy in this study.

A study from Finland also showed that no excess risk of adverse pregnancy outcomes such as preterm delivery, fetal growth restriction, LBW, and neonatal death was observed in adolescent mothers who attended high quality maternity care (Raatikainen et al., 2006). Almost all pregnant women in the study took early antenatal care with minimum six to eight antenatal visits and delivered at the University Hospital. The findings suggested that the increased risks for adverse birth outcomes seem to be overcome by good maternal health care.

Young et al. (2007) found that in Jamaica, there was no significant difference in adverse pregnancy outcomes (both preterm and low birth weight delivery) and in the number of neonatal admissions between two groups of mothers (19 years and younger adolescent mothers and older mothers) who received similar and adequate antenatal care and delivered their babies at the University Hospital.

Those findings agree with the findings from Finland. However, both studies were conducted in University hospitals where there is high quality maternal care system.

A case control study at a regional hospital from Bangkok found that considering maternal occupation, parity, and number of antenatal visits as controlling variables, the incidence of preterm labor in the study group (adolescent mothers aged 19 and younger) was not significantly higher than the control group (adult mothers aged 20-34). However, when data was analyzed by categorizing gestational age at delivery into >37 weeks, 33-37 weeks and 20-32 weeks, preterm delivery rate for 33-37 weeks gestation was higher in adolescent mothers, but it was not significantly different for gestational age 20-32 weeks between the study and the control group. Similarly, although no significant difference was found in the rate of LBW delivery, mean low birth weight was lower among babies born to adolescent mothers. Regarding admission rate to special care baby unit, there was no significant difference between study group and control group (Thato et al., 2007). It seems that adolescent pregnancy outcomes were favorable in Thailand where universal access to health services is available. The study population included only mothers who took prenatal care and delivered their babies at the regional hospital of Bangkok.

Although there were many previous studies concerning obstetric outcomes of adolescent pregnancy, the results were not similar. The reported differences have several possible explanations. Firstly, different studies used different age groups of adolescents. Accordingly, the effects on pregnancy outcomes of adolescent mothers varied. Another explanation could be radical differences in health care standards between different study areas. Also, the differing results may partly stem from different quality of data about maternal risk factors, complications and pregnancy outcomes.

2.4 Adolescent reproductive health in Thailand

In 2009, out of 67 million in Thailand, 2.58 million were young women aged 15-19 years (National Statistical Office, 2009). In Thailand, adolescent reproductive health problem has become a significant issue in recent years because of

increasing sexual activity among adolescents, leading to a substantial number of teenage pregnancies. Adolescent fertility is relatively high in Thailand. Age specific fertility rate for Thai adolescent girls aged 15-19 years is 49 per 1000 which is higher than the regional average of South East Asia (34 per 1000). Fertility of women aged 15-19 years accounts for 16% of total fertility, which is the highest among ASEAN countries (UNESCAP, 2008).

High levels of premarital sexual activity and social and cultural constraints in providing reproductive health, contraceptive knowledge, and good quality services to adolescents are related to a high incidence of unplanned adolescent pregnancies (United Nations Population Fund, 2005). The possible negative consequences are unsafe abortion, lack of maternal health care, sexually transmitted disease and HIV in pregnancy, and adverse pregnancy outcomes. To prevent adolescent pregnancy and to improve their reproductive health outcomes, it is critical to provide accurate and adequate sexual and contraceptive knowledge to young people including out-of-school adolescents.

Prevention of adolescent pregnancy receives special attention in the National Economic and Social Development Plans, aiming at reducing teenage pregnancy rate below 10%. The principal strategies that have been used in implementing programs for adolescents in Thailand are to increase knowledge of reproductive health; to build skills in problem solving, decision-making and life planning; to offer youth-friendly services; and to promote safe and supportive environments (Ministry of Public Health & World Health Organization, 2003). The programs have been implemented in adolescent reproductive health are 1) Compulsory sex education in schools; 2) Counseling services; 3) Innovative source of information; 4) Friend's corner: Youth friendly health services. However, adolescent reproductive health programs can reach only a small proportion of the adolescent population (United Nations Population Fund, 2005). In addition, because of social and cultural norms, gender-based double standard, and poor access to contraceptive methods, these programs could not reduce the gap between knowledge and safe sex practices among adolescents.

2.5 Situations of maternal and child health in Thailand

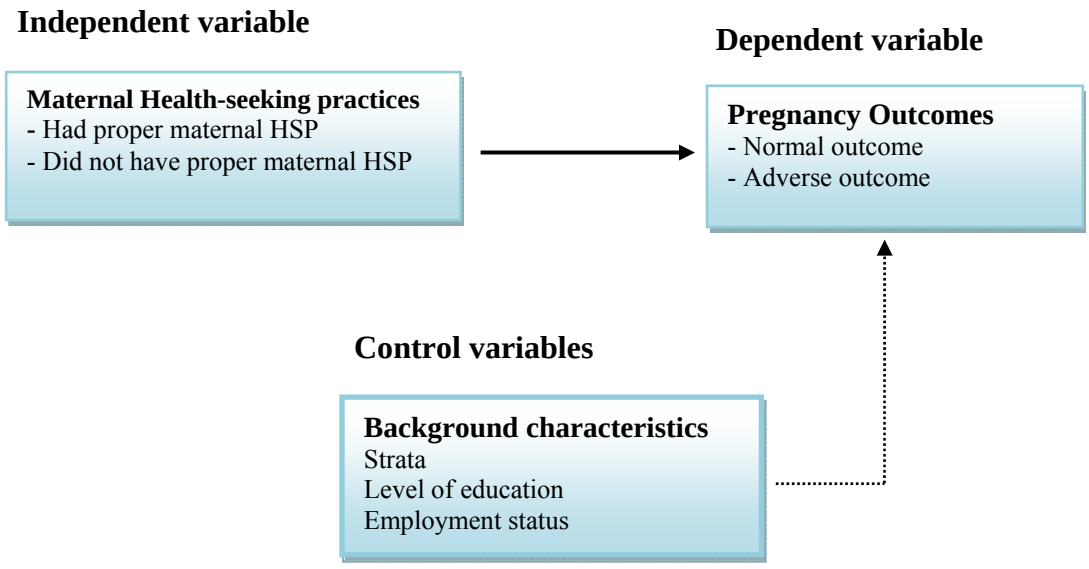
In Thailand, the majority of the maternal and child health (MCH) services are being provided by the government, delivering throughout the country at all levels of the health care system (Ministry of Public Health, 2005). 'Safe Motherhood Program' was successfully initiated in 1988, aiming at improving maternal and newborn health, together with promoting quality maternal and child health services. It was implemented nearly all over the country by 1994. Then the Safe Motherhood Hospital (SMH) Program was launched in 1998 (formerly called 'Excellent Safe Motherhood Hospital Initiative') to reduce maternal and neonatal mortality and morbidity. In 2001, Universal Health Care Coverage was introduced so that all Thai people including pregnant mothers can easily access quality health care services. These efforts have helped improve maternal and child health to a greater extent.

The use of maternal health care services in Thailand is almost universal. According to the United Nations Children's Fund (2010), antenatal care coverage, at least one-time, among pregnant women during 2003 and 2008 is 98 percent, and almost all of the births (97 percent) take place in institutions and are assisted by skilled birth attendants. As a result, the maternal and child health indicators in Thailand are better than in other developing countries. Maternal Mortality Ratio (MMR) was 9.8 per 100,000 live births in 2006 (Ministry of Public Health, 2007); Perinatal Mortality Rate was 9.15 per 1000 total births in 2002 (Safe Motherhood Program, 2002); Neonatal Mortality Rate (NMR) was 9 in 2004 (UNICEF, 2010))

Despite the achievements in overall maternal and child health indicators, adolescent mothers and their babies have higher risks for potentially serious health problems. Some findings related to the outcomes of adolescent pregnancy in Thailand were: the primigravida adolescent mothers aged 13-19 had a significantly higher incidence of preterm birth and LBW babies compared with primigravida women aged 20-25 (20.1% vs 13.9% and 17% vs 13% respectively) (Watcharaseranee et al., 2006); the percentage of LBW for adolescents (14-19 years) and adult mothers (20-24 years) differed significantly, 15.5% and 8.8% (Isaranurug et al., 2006); there were significant higher rates of preterm deliveries (33-37 weeks gestation) (OR 1.21, CI 1.01-1.75) and lower mean birth weight among babies born to adolescent mothers compared with babies of adult mothers aged 20-34 (Thato et al., 2007). Although the Thai

government has provided reproductive health services to all individuals irrespective of their age, use of maternal health services among adolescent mothers is less than adult mothers.

2.5 Conceptual Framework



This study investigated the effect of maternal health-seeking practices on pregnancy outcomes of adolescent mothers aged 15-19 and adult mothers aged 20-29. 'Pregnancy outcomes' was the dependent variable categorized as normal and adverse outcomes. Adverse pregnancy outcomes included preterm, LBW, and admission to hospitals. 'Maternal health-seeking practices' was the independent variable. The maternal health-seeking practices included antenatal care and delivery care. It was divided into two categories, 1) had proper maternal health-seeking practices; 2) did not have proper maternal health-seeking practices. Background characteristics of mothers such as levels of education, employment status, and residence were control variables in this study.

2.6 Research Hypothesis

The risk of adverse pregnancy outcomes of nulliparous adolescent mothers who have had proper maternal health-seeking practices during their pregnancy and childbirth will be lower than the risk of those who did not have proper health-seeking practices.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Source of data

This study used the secondary data from the additional module of Kanchanaburi Demographic Surveillance System (KDSS) named Survey of Pregnancy, Birth and Early Life (SPBEL). KDSS is a five year research project of the Institute for Population and Social Research, Mahidol University, Thailand, conducted during the period of 2000 to 2004. The Survey of Pregnancy, Birth and Early Life was conducted in July and August 2003, which investigated the use of antenatal, delivery and postnatal care services, health problems during pregnancy and delivery, breastfeeding, and the health of baby as reported by mothers.

3.2 Study area

The study area is located in Kanchanaburi province situated in the western part of the central region of Thailand. The province includes both mountainous and plain areas and shares long border with Myanmar to the west. It is one of the largest of the 76 provinces of Thailand. The total area of the province is about 19,483 square kilometers, involving 13 districts, 98 sub-districts, and 887 villages. According to the 2000 population and housing census, the population is 734,000 in this province with 8.6% and 17% of women aged 15-19 and 20-29 years respectively. The majority of respondents are Thai (96 percent) and Buddhist (99 percent) (National Statistical Office, 2000). The socio-economic and topographic characteristics of Kanchanaburi province are similar to other provinces of Thailand.

In KDSS areas, regarding maternal health service utilization, 80% of mothers received ANC at least one time and 90% of births were attended by skilled-birth attendants (Vong-ek, Inprom, & Santiphop, 2006). According to the 2000

Population and Housing Census, maternal mortality ratio (MMR) was 0.0 per 100,000 live births and perinatal mortality rate was 9.87 per 1,000 total births. Low birth weight was 9.83 % and rate of mothers aged less than 20 years was 18.02 % of total births (UNESCAP, 2001).

3.3 Sampling and study population

The KDSS used a stratified systematic sampling method. According to the main occupation of the population and land use patterns, the whole province was divided into five strata such as urban/semi urban, rice, plantation, upland, and mixed economy. Then, twenty communities were systematically and randomly selected from each stratum. The KDSS was conducted in a sample of 100 communities (86 villages and 14 census blocks) (Institute for Population and Social Research, 2001). The purpose of the selection was to reflect the diversity in social, economic, and ecological conditions of the province.

The SPBEL survey was conducted in those 100 communities of Kanchanaburi project. The samples of primary data were 1,248 women who were pregnant at the time of survey or who experienced birth (live birth or stillbirth) or abortion two years prior to the survey. From those 1,248 women, nulliparous adolescent mothers aged 15-19 (n = 117) and adult mothers aged 20-29 (n = 193) who have delivered singleton live births within two years were selected for this study. The age of woman was defined as her age at the time of delivery. Maternal health-seeking practices and pregnancy outcomes of adolescent mothers was compared with adult mothers since mothers with 20-29 years old have the lowest risk of adverse outcomes.

3.4 Data collection

The questionnaire for SPBEL project was developed by the investigator team involved social scientist, obstetrician and gynaecologist, physician, and technical nurse. The questionnaire was pre-tested five times in some villages outside the Kanchanaburi project area to check the content of the questionnaire and was revised

them to be understandable and consistent. Then, female interviewers living in Kanchanaburi who had similar socio-economic status with the respondents were selected and given three weeks intensive training by the investigator team to ensure accurate and standardized interviewing. Local interpreters were used where many women spoke local language. Before data collection, they were trained for understanding the questions and to be able to communicate with the respondents. The field supervisors and research assistants checked completeness and accuracy of data throughout the data collection period (Vong-ek et al., 2006).

The questionnaire in the SPBEL project included questions regarding utilization of health services, maternal illnesses during pregnancy, childbirth, and post-partum period, and neonatal illnesses. Therefore, a special validation study was carried out in five district hospitals in Kanchanaburi Province to validate the information between the women's report in the survey and the hospital records.

3.5 Operational definitions

3.5.1 Dependent variable

Pregnancy outcomes

If a woman had a history of delivering a baby with at least one outcome of interest such as preterm, LBW or admission to hospitals, it was regarded that she had **adverse pregnancy outcomes**. For women who delivered a baby without any of those outcomes, it was categorized that she had **normal pregnancy outcomes**.

- **Preterm** – Infants who were delivered before 37 completed weeks of gestation will be regarded as preterm.
- **Low birth weight** – Infants will be considered as low birth weight if its birth weight is less than 2500 gram.
- **Admission to hospitals** – If the baby was admitted to hospital for any neonatal illnesses during the first month after birth, it will be included in this category.

The information regarding birth weight of babies in the primary data was collected by individual interview and cross-checked with MCH records.

3.5.2 Independent variable

Maternal Health seeking practices

If a woman took antenatal care from the health personnel (doctor or nurse) for four or more times during pregnancy and delivered their babies with the help of the health personnel at any health facility (government hospital, private hospital, private clinic or health center), she was considered to have had proper maternal health-seeking practices. Otherwise, she was regarded that she did not have proper maternal health-seeking practices.

3.5.3 Control variables

Control variables included residence, completed levels of education and employment status of mothers.

Table 3.1 Description of variables

Variable	Description	Scale of measurement
Background characteristics of mothers		
Age at delivery	Respondent's age of completed years at the time of delivery 0 = adult mothers (20-29 years), 1 = adolescent mothers (15-19 years)	Nominal
Residence	The study area was divided into five strata according to the main occupation and land use patterns of the respondent. In this study we categorized into two: 0 = urban/ semi-urban (urban/semi-urban stratum) 1 = rural (rice, plantation, upland and mixed economy strata).	Nominal

Level of education	Respondent's completed level of education 1 = no education, 1 = primary education, 3 = secondary and higher	Ordinal
Employment status	Employment status of the respondent 0 = unemployed, 1 = employed	Nominal
Health-seeking practices during pregnancy		
Receiving antenatal care	The respondent received antenatal care at least one visit during pregnancy from health provider. 0 = no, 1 = yes	Nominal
Place of ANC	Place of ANC received 1 = governmental hospital, 2 = private hospital/clinic, 3 = health center, 4 = traditional birth attendants' home/ Others	Nominal
Antenatal care provider	Type of antenatal care provider 0 = TBA/other, 1 = doctor/ nurse	Nominal
Months of pregnancy at first visit	Months of pregnancy at first antenatal visit 0 = one to three months, 1 = four or more months	Ordinal
Number of antenatal visits during pregnancy	Number of antenatal visits received by mother during pregnancy 0 = less than four times, 1 = four or more times	Ordinal
Health-seeking practice during delivery		
Place of delivery	The place where mother gave birth, 0 = non health facilities, 1 = health facilities	Nominal
Birth attendant	The person who assisted the delivery, 0 = TBA/ others, 1 = doctor/ nurse	Nominal
Maternal health-seeking practices during pregnancy and childbirth		
Maternal Health seeking practices	0 = did not have proper maternal health seeking practices, 1 = had proper maternal health seeking practices	Nominal

Pregnancy outcomes		
Preterm	Pregnancy gestation in weeks at the time of delivery 0 = term (≥ 38 wks), 1 = preterm (< 38 wks)	Nominal
Low birth weight	Birth weight of baby in gram at the time of delivery 0 = normal birth weight (≥ 2500 g), 1 = low birth weight (< 2500 g)	Nominal
Admission to hospitals	The baby had history of admission to hospitals within one month of life for any neonatal illnesses 0 = no, 1 = yes	Nominal
Pregnancy outcomes	0 = normal outcomes, 1 = adverse outcomes which included preterm, LBW or admission to hospitals	Nominal

3.6 Method of Data Analysis

Regarding maternal health seeking practices, the statistical differences between adolescent and adult groups were evaluated using student *t*-test and Chi-square test (or Fisher's exact test when appropriate). A p-value <0.05 was considered statistically significant.

Multivariate analysis (binary logistic regression) was performed to determine the effect of maternal health-seeking practices on pregnancy outcomes controlling for their background characteristics. Confidence interval (CI) was evaluated at 95% level.

3.7 Study Limitations

There were some important limitations in our study which are worth to mention. Firstly, information on birth weight of babies relied on self-reported information for those who did not take antenatal care at all or those who lost their

MCH booklets. However, majority of mothers took antenatal care and the information was cross-checked with MCH booklets. Secondly, the information about duration of pregnancy to define preterm birth was based on the respondent's self report of gestational period. According to the literature review, maternal height and maternal weight gain during pregnancy are attributed to the outcomes of pregnancy. However, one fourth of mothers in the primary data did not respond their height and weight gain during pregnancy. Therefore, those two variables were not included in this study. Thirdly, small sample size restricts the study to detect the important associations, to look at rare neonatal outcomes such as still birth and neonatal death, and to include variables with low percentage among Thai women like smoking habit during pregnancy.

3.8 Ethical Issue

Participation of respondents in the primary data was voluntary. Informed consent was obtained from the respondents after explaining the nature of the study. Confidentiality was considered as an utmost concern. The survey was conducted with the approval of Institutional Review Board of IPSR.

CHAPTER IV
RESEARCH FINDINGS AND DISCUSSION

Among 1,065 mothers who were involved in SPBEL, 140 women were less than 20 years of age. Accordingly, adolescent pregnancy in KDSS represented 13.1% of all pregnancies. The adolescent pregnancy rate was highest in upland stratum, 47.1% and it was followed by mixed economy stratum, 18.6%. The others were 7.1% in urban/semi-urban stratum, 12.1% in rice stratum, and 15.0% in plantation stratum. Most adolescent mothers (78.6%) were 17 to 19 years of age and 21.4% were 15 to 16 years old. Regarding parity, 84.2% of adolescent mothers were primiparous, 15.8% were multiparous mothers at the time of survey. Adult mothers aged 20-29 years accounted for 53.3% (n = 568) of all pregnancies. Among adult mothers, 34.0% were primipara and, 66.0% were multipara. The analyses in this study were performed with 117 adolescent and 193 adult mothers of parity one.

4.1 Research findings

4.1.1 Background characteristics of mothers

Comparing some background characteristics between adolescent and adult mothers, the majority of mothers (93.7% adolescent and 96.3% adult) in this study were married and 6.3% of adolescent mothers and 3.1% of adult mothers were widowed or separated from their spouse (data not shown). Most of the respondents (88.1%) were from rural areas (rice, plantation, upland, and mixed economy strata), while only 11.9% of mothers were living in urban/semi-urban stratum. According to the percentage distribution of mothers within five strata, a higher percentage of both adolescent and adult mothers were living in upland stratum, and urban/semi-urban stratum had the lowest percentage of mothers compared with other strata. Concerning the levels of education, the percentage of respondents who had completed secondary

level education was not very different between adolescent and adult mothers. Approximately 8% of adolescent mothers and 12% of adult mothers did not attend any formal or informal education. It was found that adolescent mothers were more likely to be unemployed compared with adult mothers (72.6% versus 58.5%), see Table 4.1.

Table 4.1 Percentage distribution of background characteristics of mothers

Background Characteristics	Adolescent mothers	Adult mothers	Total
	%	%	%
Residence			
Urban/semi-urban	7.7	14.5	11.9
Rural			
Rice	12.0	19.2	16.5
Plantation	13.7	16.6	15.5
Upland	45.3	34.7	38.7
Mixed economy	21.4	15.0	17.4
Level of education			
No education	7.7	12.4	10.7
Primary	49.6	35.2	40.6
Secondary and above	42.7	52.3	48.7
Employment status			
Unemployed	72.6	58.5	63.9
Employed	27.4	41.5	36.1
Total	**100.0 (117)**	**100.0 (193)**	**100.0 (310)**

4.1.2 Maternal health-seeking practices

Antenatal and delivery care practices of adolescent and adult mothers are displayed in Table 4.2. The majority of mothers in both groups took ANC at least one time and 24.8% adolescent mothers and 18.1% adult mothers did not receive antenatal care from skilled health providers during their pregnancy. Adolescent mothers were significantly less likely to attend early ANC than adult mothers within the first three

months of pregnancy (51.1% and 74.4% respectively). However, almost all mothers (96.6% adolescents and 97.5% adults) had already attended their first antenatal visit at their six months of pregnancy. More adolescent mothers attended less than four antenatal visits than adults (10.3% and 4.5% respectively) but it was not statistically significant. However, the mean numbers of antenatal visits was significantly different and adolescent mothers attended fewer antenatal visits than older mothers (7.2 and 8.7). Regarding place of ANC, the vast majority of mothers in both groups (97.8% of adolescents and 85.4% of adults) received ANC at public health institutions, such as government hospitals and health centers (data not shown).

A high proportion of women (approximately 90%) in this study delivered their babies at health facilities with the help of skilled health providers. We found no statistically significant differences between adolescents and adults regarding place of delivery and type of birth attendants.

Table 4.2 Percentage distribution of maternal health-seeking care practices

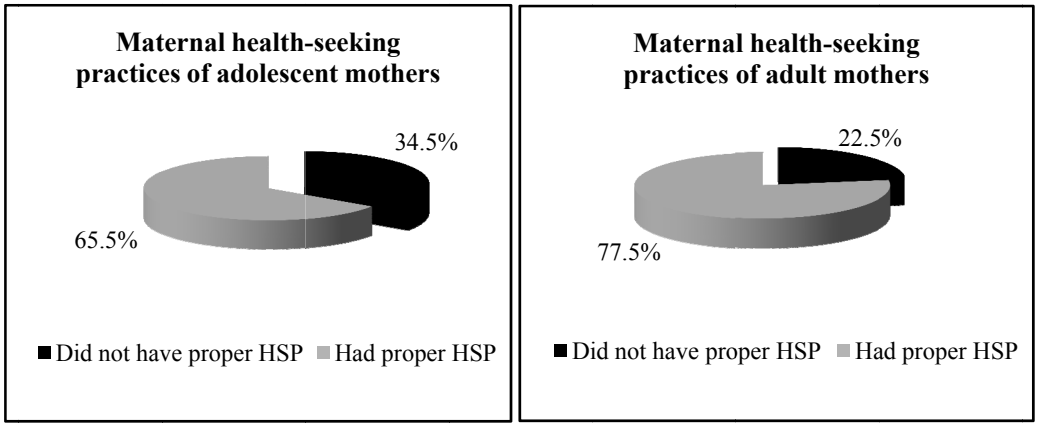
Health-seeking practices	Adolescent mothers	Adult mothers	p-value
	%	%	
Antenatal care (at least one time) (n =310)			
Yes	75.2	81.9	NS
No	24.8	18.1	
Total	**100.0 (117)**	**100.0 (193)**	
Months of pregnancy at first ANC visit [a] (n = 244)			
0-3	51.1	74.4	< 0.01
4-6	45.5	23.1	
7 or more	3.4	2.6	
Total	**100.0 (88)**	**100.0 (156)**	
Number of ANC visits [a] (n = 243)			
Less than four times	10.3	4.5	NS
Four or more times	89.7	95.5	
Total	**100.0 (87)**	**100.0 (156)**	
Mean number of ANC visits [a] (SD)	7.2 (2.9)	8.7 (3.0)	< 0.001
Birth attendant [a] (n = 309)			
Doctor/ Nurse	91.4	93.3	NS
TBA/ others	8.6	6.7	
Total	**100.0 (116)**	**100.0 (193)**	
Place for birth (n = 310)			
Health facilities	92.3	93.8	NS
Non-health facilities	7.7	6.2	
Total	**100.0 (117)**	**100.0 (193)**	

NS: Not significant; SD: Standard Deviation; [a] Missing cases were excluded.

According to antenatal and delivery care practices of mothers, we categorized maternal health-seeking practice into two types, 1) had proper health-seeking practices and 2) did not have proper health seeking practices. Those who took antenatal care with skilled health providers (doctors or nurses) at least four times and delivered their babies at health facilities were considered to have had proper health-seeking practices. Otherwise, they were regarded as mothers who did not have proper health-seeking practices.

In Figure 4.1, although a high percentage of mothers from both groups had proper health-seeking practices, adolescent mothers were less likely to have had proper maternal health-seeking practices than their adult counterparts. About one-third of adolescent mothers (40 out of 117 cases) and one-fifth of adult mothers (43 out of 193 cases) did not have proper health-seeking practices during their pregnancy and childbirth. The difference was statistically significant.

Figure 4.1 Percentage distribution of maternal health-seeking practices



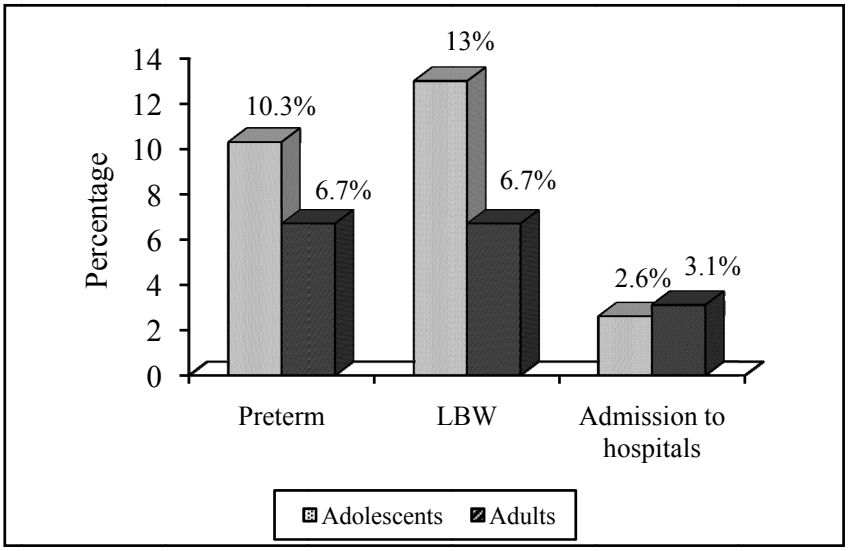
$p < 0.05$; HSP: health-seeking practices

4.1.3 Pregnancy outcomes

In this study, there were three pregnancy outcomes of interest such as preterm, LBW and admission to hospitals. Figure 4.2 shows the percentage of each outcome of interest among adolescent and adult mothers. Adolescent mothers gave birth to a higher proportion of preterm (10.3%) and LBW babies (13.0%) than adult mothers (6.7% preterm and 6.7% LBW). In our study, LBW included both term and preterm babies who weighed less than 2500 g. Babies who were term with birth

weight less than 2500 g accounted for 11.1% for adolescents and 5.5% for adults. Only a small percentage of babies were admitted to hospitals in both groups of mothers. No significant differences were observed for each outcome of interest between adolescents and adults.

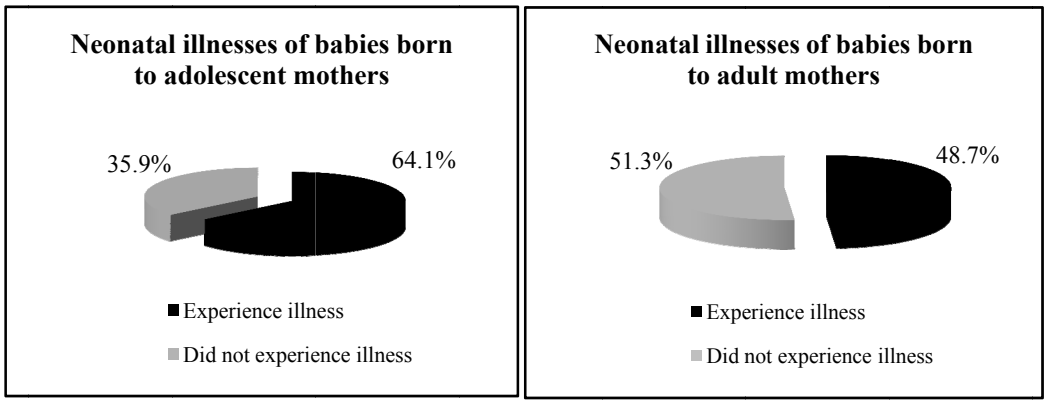
Figure 4.2 Percentage of each pregnancy outcome of interest among adolescent and adult mothers



p = Not significant

It was found that only nine babies were admitted to neonatal care units to receive intensive care or treatment. However, we found that 169 babies experienced neonatal illnesses during their first month. In Figure 4.3, a significantly higher percentage of babies born to adolescent mothers (64.1%) encountered neonatal illnesses than babies born to adult mothers (48.7%). Of those, approximately half of mothers went to health facilities to seek treatment for their babies' illnesses.

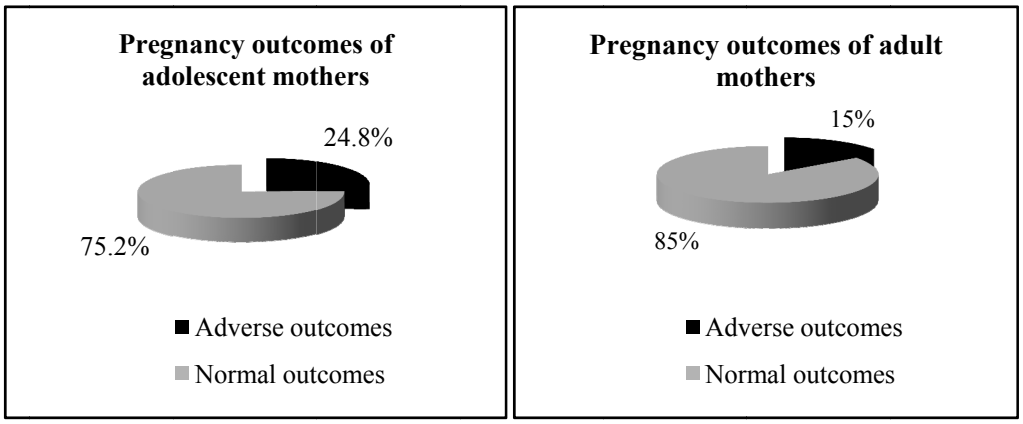
Figure 4.3 Percentage distribution of experiencing neonatal illnesses



$p < 0.05$

Figure 4.4 demonstrates the percentage of normal and adverse pregnancy outcomes of adolescent and adult mothers. Adverse pregnancy outcomes included all outcomes of interest such as preterm, LBW and admission to hospitals. The study found that adolescent mothers were significantly more likely to experience adverse pregnancy outcomes (24.8%) than adult mothers (15.0%).

Figure 4.4 Percentage distribution of pregnancy outcomes of adolescent and adult mothers



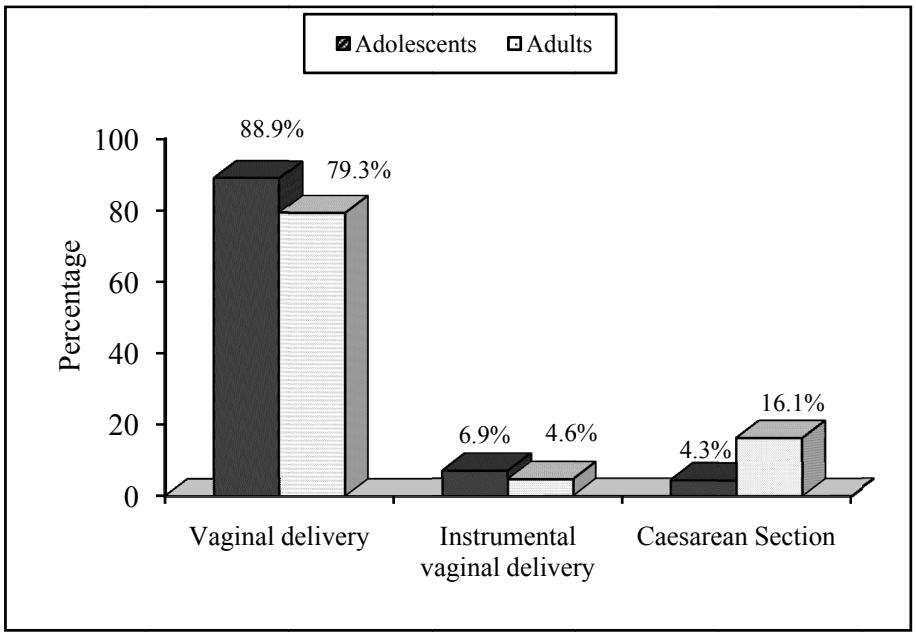
$p < 0.05$

4.1.4 Mode of delivery

It is believed that adolescent mothers have an increased risk of caesarean section rate because biological immaturity of their pelvis can cause cephalopelvic disproportion. However, in our study, we found that the incidence of vaginal delivery was higher (88.9% versus 79.3%) and the incidence of caesarean section was lower

(4.3% versus 16.1%) in adolescent pregnancies compared with adult pregnancies. There was no difference in the rate of instrumental vaginal delivery (forceps or ventouse delivery) between two groups (Figure 4.5). It seems that adolescent mothers had better obstetric performance than adult mothers.

Figure 4.5 Percentage distribution of mode of delivery among adolescent and adult mothers



4.1.5 Maternal health-seeking practices and pregnancy outcomes

Table 4.3 shows the percentage of each pregnancy outcome (preterm, LBW and admission to hospitals) with their health-seeking practices. The differences in percentage of preterm and LBW delivery were not statistically significant between mothers who had proper health-seeking practices and those who did not have proper health-seeking practices. It seems that giving birth of preterm and LBW babies was not associated with their health-seeking practices. The findings showed that all babies admitted to neonatal care units were born to mothers who had proper health-seeking practices in both adolescent and adult groups.

The percentage of adverse pregnancy outcomes which included preterm, LBW, and admission to hospitals among adolescent mothers was not different between mothers who had proper health-seeking practices and mothers who did not have proper

health-seeking practices (25% in both groups). Similarly, non-significant difference was observed among adult mothers (16.3% and 6.5%).

Nevertheless, the pregnancy outcomes of adolescent mothers were poorer than adult mothers regardless of their health-seeking practices.

Table 4.3 Percentage of pregnancy outcomes with health-seeking practices

Pregnancy Outcomes	Adolescent mothers		Adult mothers	
	Proper HSP	Not proper HSP	Proper HSP	Not proper HSP
	%	%	%	%
Preterm				
<38 weeks	9.2	12.5	6.8	4.7
≥38 weeks	90.8	87.5	92.5	90.9
Total	**100.0 (76)**	**100.0 (40)**	**100.0 (148)**	**100.0 (43)**
LBW [a]				
<2500g	13.2	12.9	7.5	3.2
≥2500g	86.8	87.1	92.5	96.8
Total	**100.0 (76)**	**100.0 (31)**	**100.0 (147)**	**100.0 (31)**
Admission to hospitals				
Yes	3.9	0	4.1	0
No	96.1	100	95.9	100
Total	**100.0 (76)**	**100.0 (40)**	**100.0 (148)**	**100.0 (31)**
Pregnancy outcomes				
Adverse outcomes	25	25	16.3	6.5
Normal outcomes	75	75	83.7	93.5
Total	**100.0 (76)**	**100.0 (32)**	**100.0 (147)**	**100.0 (31)**

HSP: health-seeking practices; [a] Missing cases are excluded; *p* = Not significant.

4.1.6 Background characteristics and pregnancy outcomes

Table 4.4 presents the bivariate analysis of pregnancy outcomes and their background characteristics among adolescent and adult mothers. The residence where mothers were currently living had a significant association with pregnancy outcomes

of adolescent mothers. Among adolescent mothers, 55.6% of women from urban/semi-urban stratum experienced adverse pregnancy outcomes. In contrast, the percentage of adverse outcomes was very low among mothers living in rural areas (22.0%). It seems that urban adolescent mothers were more likely to face adverse birth outcomes than mothers from rural areas. The incidence of adverse pregnancy outcomes among adolescent mothers who were uneducated or unemployed was higher than the incidence of their educated or employed counterparts although these findings were not statistically significant. At the same time, bivariate analysis for adult mothers also showed no significant associations between pregnancy outcomes and selected background characteristics.

Similarly, non-significant associations were observed when analysis was performed with all mothers (both adolescents and adults). A high percentage of mothers from urban/semi-urban stratum (30.6%) faced adverse pregnancy outcomes, whereas mothers living in rural areas including rice, plantation, upland and mixed economy strata seemed to have lower incidence of adverse outcomes (17.0%). Regarding level of education, it was observed that the higher the level of education, the lower the incidence of adverse outcomes. Unemployed mothers experienced more adverse pregnancy outcomes than employed mothers (20.9% versus 15.0%). However, they were not statistically significant.

Table 4.4 Percentage of pregnancy outcomes with background characteristics

Variables	Adolescents (n = 109)		Adults (n = 180)		Both (n = 289)	
	Normal %	Adverse %	Normal %	Adverse %	Normal %	Adverse %
Residence						
Urban/semi-urban	44.4	55.6	77.8	22.2	69.4	30.6
Rural	78.0	22.0	86.3	13.7	83.0	17.0
Level of education						
No education	50.0	50.0	83.3	16.7	75.0	25.0
Primary	81.1	18.9	79.0	21.0	80.0	20.0
Secondary and above	72.0	28.0	89.0	11.0	83.3	16.7
Employment status						
Unemployed	72.5	27.5	84.3	15.7	79.1	20.9
Employed	82.8	17.2	85.9	14.1	85.0	15.0

Note: $p < 0.05$ for "Residence" in adolescents group. Other variables were not significant.

4.1.7 Binary logistic regression on pregnancy outcomes

Table 4.5 depicts the adjusted odds ratios of adverse pregnancy outcomes among adolescents, adults, and both groups of mothers. Maternal health-seeking practices also showed no significant effect on pregnancy outcomes of any group of mothers in multivariate models.

Restricting analysis to adolescent mothers, young mothers from rural areas were less likely to have adverse outcomes (AOR 0.25; 95% CI, 0.06-1.11). However, the results showed no significance. Similarly, the risks were lower among adolescent mothers who completed primary (AOR 0.19; 95% CI, 0.03-1.20) and secondary or higher level education (AOR 0.25; 95% CI, 0.04-1.58) than uneducated mothers although these were not statistically significant.

Secondly, the analysis was confined to adult mothers. Maternal background characteristics were also not significantly associated with pregnancy outcomes. Adult mothers from rural areas had a lower risk of adverse birth outcomes (AOR 0.16; 95% CI, 0.03-0.79). They were also not significant.

When analysis was performed with all mothers (adolescents and adults) and the variable “age group” was introduced into the multivariate model, adolescent mothers had twice the risk of adverse pregnancy outcomes than adult mothers (AOR 2.00; 95% CI, 1.04-3.87) after controlling their background characteristics and health-seeking practices. It seems that age was a significant risk factor for adverse pregnancy outcomes. Concerning residence, women from rural areas were at lower risk of adverse outcomes compared with women from urban/semi-urban areas (AOR 0.38; 95% CI, 0.16-0.87) and it was statistically significant at 0.05 level. Statistical differences in pregnancy outcomes were not found regarding level of education and employment status of mothers.

We could not find the significant effect of health-seeking practices on pregnancy outcomes even when we added one more criteria (first antenatal visit within three months of pregnancy) into the category of proper maternal health-seeking practices. The risk of adverse pregnancy outcomes was not different between mothers who took early and adequate antenatal visits and delivered at health facility and mothers who did not (data not shown).

Table 4.5 Adjusted odds ratios of adverse pregnancy outcomes from binary logistic regression

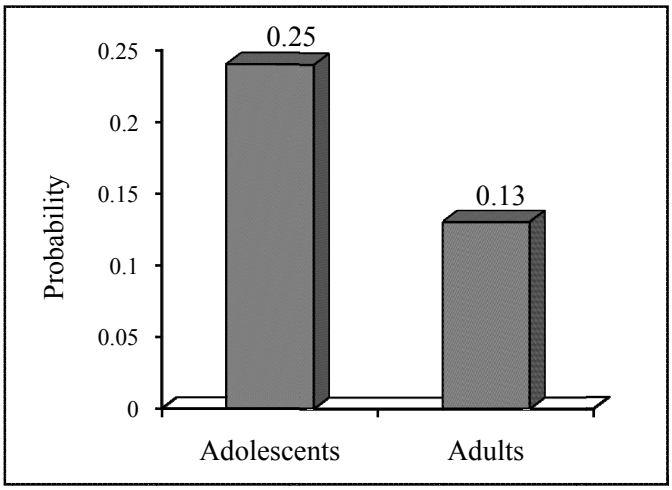
Variables	Adolescents	Adults	Both
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Health-seeking practices			
Not proper ®			
Proper	1.10 (0.39-3.12)	3.14(0.67-14.78)	1.42 (0.63-3.17)
Residence			
Urban/semi-urban ®			
Rural	0.25 (0.06-1.11)	0.50 (0.17-1.47)	0.38 (0.16-0.87) *
Level of education			
No education ®			
Primary education	0.19 (0.03-1.20)	0.11 (0.26-4.72)	0.56 (0.19-1.65)
Secondary and higher	0.25 (0.04-1.58)	0.45 (0.10-1.97)	0.43 (0.15-1.26)
Employment status			
Unemployed ®			
Employed	0.61 (0.19-1.97)	0.74 (0.30-1.81)	0.69 (0.35-1.35)
Age			
Adult ®			
Adolescent			2.13 (1.11-4.06) *
n	108	178	286
df	8	8	9
LR chi-square	7.76	7.45	13.24 *

* $p < 0.05$; AOR: adjusted odds ratio; CI: confidence interval; ® Reference group

4.1.8 Adjusted proportionate probabilities of adverse pregnancy outcomes of adolescent and adult mothers

The examination of adjusted proportionate probability of adverse pregnancy outcomes between adolescent and adult mothers showed that the chance for occurring adverse pregnancy outcomes for adult mothers was 0.13 while the probability for experiencing adverse outcomes for adolescent mothers was 0.24 after controlling residence, level of education, employment status, and health-seeking practices (Figure 4.6). Adolescent mothers were significantly more likely to experience adverse pregnancy outcomes compared to adult mothers by 11%.

Figure 4.6 Adjusted proportionate probabilities of adverse pregnancy outcomes of adolescent and adult mothers



4.2 Discussion

Maternal health-seeking practices and pregnancy outcomes of nulliparous adolescent and adult mothers were examined in this study. We found no significant associations between pregnancy outcomes and their health-seeking practices with or without adjustment of their background characteristics. On the other hand, even after controlling for other variables, the risk of adverse outcomes of adolescent pregnancy was still higher than that of adult pregnancy.

Adverse pregnancy outcomes are likely to differ between younger (15-17 years) and older (17-19 years) adolescents (WHO, 2004). However, in this study, pregnancy outcomes between younger and older adolescents were not significantly different in the preliminary analysis. Therefore, we included all mothers aged from 15 to 19 years in the adolescent group.

According to our findings, the percentage of adolescent pregnancy (15-19 years) in KDSS was 13%. This finding is similar to the figure of UNESCAP (2005) and that of a population-based prospective cohort study conducted in four geographically different districts of Thailand, which reported that teenage pregnancies accounted for 13.3% of all pregnancies (Isaranurug et al., 2006). This prevalence rate

is higher than other ASEAN countries. The underlying causes of this high prevalence rate may be high level of premarital sexual activity, inadequate reproductive health knowledge, and poor access to modern contraceptive methods. Even though school-based sex education is provided in the curriculum of both primary and secondary school, there is still a gap between knowledge and safe sex practice among adolescents. World Health Organization (2004) reported that social deprivation and ethnic inequality have some what effect on adolescent pregnancy rate, and early pregnancy and childbearing is more common among highly disadvantaged population. Our study also found that adolescent pregnancy rate was the highest in the upland stratum (47.1%) which is the most remote, least developed in the province, and where the most ethnic minorities are living.

Regarding levels of education, adolescent mothers in the present study had completed similar education levels like adult mothers. In contrast to our result, Jimenez, Martin, and Garcia (2000) found that adolescent mothers had lower educational attainment than adult mothers. However, Isaranurug et al. (2006) found that adolescent mothers had completed higher level education than adult mothers. It may be because of the improved access to education in Thailand for the present younger generation. World Health Organization (2007) reported that when early pregnancy forced young girls to leave school early, they lost educational and employment opportunities. As a result, adolescent mothers were more likely to be unemployed. In our study, however, although the educational attainment between adolescent and adults was not significantly different, a higher proportion of adolescent mothers were unemployed in comparison with adult mothers. Gupta et al. (2008) also reported that young mothers less than 20 years were more unemployed than adult mothers. One possible explanation for the high unemployment rate among adolescent mothers is that most of adolescent mothers are living with their parents (Jimenez et al., 2000) and they are financially dependent on their parents or relatives.

In the study area, a high percentage of both adolescent (75.2%) and adult mothers (81.9%) attended ANC clinics at least one time even though it is lower than the national figure of 98% (UNICEF, 2010). Approximately 90% of them received four or more antenatal visits. This high level of utilization may be partly due to convenient access to health services. In Thailand, universal health care coverage helps

mothers to get easy access to antenatal care. Moreover, every sub-district has a health center which could provide routine antenatal care for pregnant women. Therefore, pregnant mothers have no major constraints to attend regular antenatal visits.

Despite high antenatal care coverage, the lower mean number of antenatal visits and delayed first antenatal visit were found among adolescent mothers compared with adult mothers. Those findings were in accordance with some other studies (Thato et al., 2007; Gupta el al., 2008), in which adolescent mothers attended fewer antenatal visits and booked late in comparison with adult mothers. It may be due to reluctance to seek health care (Atuyambe et al., 2008), pregnancy denial out of fear or lack of pregnancy knowledge (Thato et al., 2007) among adolescent mothers. In addition, most adolescent mothers came from families with low income and other adverse social circumstances. These conditions made it difficult to seek timely and appropriate health care (Magadi, 2006).

This study showed that hospital delivery rate was high among both adolescent and adult mothers (over 90%) and only few mothers gave birth at home. This may be because of free access for mothers to deliver at hospitals and of good transportation in Thailand even in rural areas. Overall, a high percentage of both adolescent and adult mothers attended adequate antenatal visits and delivered at health facilities. However, compared with adult mothers, a lower percentage of adolescent mothers had proper maternal health-seeking practices (65.5% adolescents and 77.5% adults).

Regarding pregnancy outcomes, adolescent mothers were found to have a higher incidence of preterm and LBW deliveries, which is usually due to biological immaturity and disadvantaged socio-economic environment. These results are supported by previous studies (Watcharaseranee et al., 2006; Isaranurug et al., 2006; Chen et al., 2007; Gupta et al., 2008). However, the rate of preterm delivery in this study (10.3% adolescents and 6.7% adults) was lower than the findings of Thato et al. (2007) (21% adolescents and 15.1% adults). This may be because our findings were based on the self-reported information from mothers.

The percentage of admitted cases to neonatal care units was very low among babies of both adolescent and adult mothers (2.6% of adolescents and 3.1% of adults). This finding contradicts the previous report of Al-Ramahi & Saleh (2006), in

which babies of adolescent mothers had a significantly higher risk of admission to hospitals. However, in our study, more than half of mothers responded that their babies developed illness during their neonatal period. Of those, 50% took their babies to hospitals or health centers to get treatment. It seems that even though those babies experienced some neonatal illnesses and needed to take treatment, their illnesses might not be serious enough to admit to neonatal care units. Compared with babies of adult mothers, neonatal illnesses were more common among babies born to adolescent mothers. It might be contributed by the higher percentage of preterm and LBW deliveries among adolescent mothers. Overall, adolescent mothers had somewhat poorer pregnancy outcomes than adults.

In our study, no significant association between pregnancy outcomes and maternal health-seeking practices among adolescent and adult mothers was observed in bivariate analysis. This lack of significant association remains true even after adjustment for socio-demographic factors. This finding suggests that maternal health care had no significant effect on pregnancy outcomes of both adolescent and adult mothers.

Generally, it is accepted that maternal care is important in screening for biological risks as well as pregnancy complications. The early detection of maternal risks and pregnancy complications, timely and appropriate medical management, and follow-up can be performed if both young and adult mothers received early and adequate maternal care. Proper maternal care can help to minimize the adverse effects of pregnancy.

Some investigators considered that pregnant adolescents were not a high risk group if they received good maternal health care and they believed that adverse pregnancy outcomes of adolescent mothers might be attributed to socio-economic factors. According to Raatikainen et al. (2006), teenage mothers did not have a worse outcome in Finland where high quality maternity care was provided free of charge. The author mentioned that high quality maternal care could overcome the risk of adverse pregnancy outcomes of adolescent mothers. The incidence of preterm birth among pregnant adolescents could be reduced by providing teenage antenatal clinics with multidisciplinary care to identify and give proper management for the risk factors (Quinlivan & Evans, 2004).

The non-significant finding regarding the effect of health-seeking practices on pregnancy outcomes may be probably due to small number of mothers, especially in the groups who did not have proper maternal health-seeking practices, resulting in insufficient power to detect differences. Moreover, cases admitted to neonatal care units were found only in groups of mothers who had proper health-seeking practices (Table 4.3). However, it can be explained that mothers who took care of their health might be more likely to seek treatment for their babies' illnesses than those who did not. In addition, some missing cases regarding birth weight of babies (6.8%) were found in the group of mothers who did not take proper health care (Table 4.3). These factors could introduce an unintended bias in analyzing the data. Furthermore, concerning birth weight of babies, some respondents had lost their MCH booklets or their MCH booklets had no information about birth weight of babies, which accounted for 13%. For those, we had to rely on their self-reported information. More importantly, to define proper maternal health care, our study emphasized on the place of antenatal and delivery care and the number of antenatal visits. We did not consider the contents and quality of care. Due to all these factors, it is difficult to conclude that maternal health care did not have significant effect on adolescent pregnancy outcomes.

When age of mothers at the time of delivery was introduced into the multivariate model, it was observed that age was a significant risk factor for adverse pregnancy outcomes. The risk of adverse pregnancy outcomes of nulliparous adolescent mothers was twice the risk of nulliparous adults after controlling other variables like education, residence, employment status and health-seeking practices. Similar results were found in Chen et al. (2007) which mentioned that adolescent pregnancy was significantly associated with increased risk of preterm, LBW and neonatal mortality even when the analysis was restricted to married mothers with age-appropriate education and adequate antenatal care. It was also consistent with the study from Latin America, in which after adjusting for confounding factors, adolescents had higher risks for preterm and LBW delivery (Conde-Agudelo et al., 2005). It was suggested that age was an independent risk factor for poor pregnancy outcomes of adolescent mothers.

In contrast to our findings, Raatikainen et al. (2006) reported that the risk of adverse outcomes of adolescent pregnancy was no longer higher than adults after

controlling confounding variables such as smoking, anemia, parity, infections during pregnancy, maternal weight, employment status, and health-seeking factors. Yoder et al. (1997) mentioned that maternal age was not an independent risk factor for adverse outcomes, and the disadvantageous socioeconomic conditions of adolescent mothers were the powerful determinants of adverse pregnancy outcomes.

Maternal risk factors such as anemia (Lone et al., 2004; Bakhtiar et al., 2007), smoking (Delpisheh et al., 2006), genital tract infections (Raatikainen et al., 2006), and low maternal height (Torres-Arreola et al., 2005) were known to be associated with preterm and LBW deliveries and these risk factors were more prevalent in adolescent mothers. Furthermore, young mothers are economically dependent on their parents or they are less likely to engage in well-paid jobs. Many of them are housewives or laborers or farmers. Therefore, they could not afford foods that can be beneficial for their health and their babies. They were more likely to be in a poor nutritional state before pregnancy than older adults (Steven-Simon, McAnarney, Roghmann, & Forbes, 1997). In our study, we could not control the above risk factors. It may be one of the reasons that we found age was a significant risk factor for adverse pregnancy outcomes.

Another aspect to consider is that adolescent mothers were exposed to socio-economic deprivation such as low income, no decision making power and poor family or social support (WHO, 2007). Psychosocial support from partners or parents during pregnancy and childbirth could be an important factor for better pregnancy outcomes. In this study, however, we did not explore social support received by mothers during their pregnancy and childbirth.

Another interesting finding in this study was urban mothers had greater risks of adverse pregnancy outcomes than mothers from rural areas including rice, plantation, upland, and mixed economy strata. However, Rachatapantanakorn et al. (2009) found that the risks of pregnancy complications such as pregnancy induced hypertension, eclampsia, and thick meconium stain which are closely associated with adverse pregnancy outcomes were lower in mothers living in urban areas than in rural areas of South of Thailand. On the other hand, a study form Kenya observed no significant difference in preterm delivery between rural and urban adolescent mothers (Magadi, 2006).

The controversy over the findings can be explained by two reasons. Firstly, in this study area, Kanchanaburi province, economic situations, employment status and educational levels of mothers, access to health care services, and quality of maternal care which have somewhat effect on pregnancy outcomes may not be very different between urban and rural areas apart from some areas in the upland stratum (Vong-ek et al., 2006). Under these circumstances, urban mothers may be more likely to be exposed to risk factors of adverse pregnancy outcomes such as genital tract infection (Raatikainen et al., 2006), psychosocial stress (Nkansah-Amankra, Luchok, Hussey, Watkins, & Lui, 2010), and exposure to traffic emissions (Pereira, Nassar, Bower, Weinstein, & Cook, 2010) than rural mothers. Secondly, as our data relied on self-reported information from the respondents, the different levels of awareness and knowledge of maternal and child health including gestational period between rural and urban mothers might reflect on this finding.

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The objectives of this study are to describe maternal health-seeking practices of adolescent and adult mothers during pregnancy and childbirth and to determine the effects of maternal health-seeking practices on their pregnancy outcomes. This study used the secondary data from a cross sectional survey named Survey of Pregnancy, Birth and Early Life (SPBEL) which was conducted in Kanchanaburi province, 2003. A total of 117 nulliparous adolescent mothers aged 15-19 and 193 nulliparous adult mothers aged 20-29 who have delivered singleton live births within two years were included in this study. Binary logistic regression was used to determine the effects of maternal health-seeking practices on pregnancy outcomes.

Our study found that the adolescent pregnancy rate (15-19 years) in KDSS areas was 13%. Regarding their background characteristics, adolescent mothers completed similar levels of education as adult mothers. A higher proportion of adolescent mothers were unemployed in comparison with adult mothers in this study. Concerning health-seeking practices, a high level utilization of antenatal care was found in both adolescent and adult mothers and most of them received four or more antenatal visits. However, delayed and less frequent antenatal visits among adolescent mothers were found compared with adult mothers. Delivery rate at health facilities was very high and the rate did not differ between adolescent and adult mothers. With respect to pregnancy outcomes, adolescent mothers were found to have a higher incidence of preterm and LBW deliveries. Overall, pregnancy outcomes of adolescent mothers were more adverse than adults.

Bivariate analysis showed maternal health-seeking practices had no significant effects on pregnancy outcomes of adolescent and adult mothers. Further adjustment of socio-demographic factors did not change the observed associations. On

the other hand, we observed that age was a significant risk factor for adverse pregnancy outcomes. Nulliparous adolescent mothers had two times higher risk of adverse pregnancy outcomes than adults. In our study, we found the associations between pregnancy outcomes and their residence. The risk of adverse pregnancy outcomes for mothers from urban/semi-urban stratum was higher than that of mothers from rural areas after controlling age, health-seeking factors, level of education and employment status.

5.2 Recommendations

On the basis of our findings, some recommendations for policy implications and future studies are formulated in this section.

5.2.1 Recommendations for policy implication

The high adolescent pregnancy rate calls for policy makers to give greater emphasis on comprehensive sex education and promotion of contraceptive use among adolescents in schools as well as in the community. Our findings point out the risk of adverse outcomes is high in adolescent pregnancies. Thus, prevention of adolescent pregnancy is the most efficient way to avoid unfavorable outcomes. Effective interventions focusing on raising awareness of the risk, increasing access to contraception, promoting delayed or safer sex practices, and reduction of social deprivation might lead to reduce teenage pregnancy rate.

Despite the overall high use of maternal health care, the service utilization is lower among adolescent mothers compared with adult mothers. It was suggested that physical and social barriers to accessing maternal health care for adolescent mothers need to be addressed. Provision of knowledge about pregnancy and childbirth and ensuring social support such as arranging transportation to health services, eliminating judgmental attitudes among health care providers, home visits for missed follow up could facilitate timely and adequate maternal health service utilization among adolescent mothers.

Adolescent mothers were more likely to deliver preterm and LBW babies. Moreover, neonatal morbidity among babies born to adolescent mothers was relatively higher than babies born to adult mothers. Even though we did not find the positive effect of maternal health care on pregnancy outcomes, according to literature review, provision of better antenatal and delivery care for pregnant adolescents could minimize the risk of adverse pregnancy outcomes. Therefore, proper counseling for adolescents is critical for timely referral for detecting and managing maternal risk factors and complications. It is also crucial to give training for health care providers to increase awareness and to understand more about the higher risks of adolescent pregnancy.

Adolescent-focused maternal clinics displaying a welcoming and encouraging attitude which could provide multidisciplinary care by detecting and managing biological as well as social risk factors can be a means of improving pregnancy outcomes of adolescent mothers. In addition, health care providers should be encouraged to counsel adolescents to postpone next conception until they are biologically, psychologically and financially able to care for another baby.

Our study found that some MCH booklets were lack of information about birth weight of babies. Approximately 15% of birth weight of babies was not recorded in MCH booklets (Vong-ek et al., 2006). It suggests that information record system is necessary to be improved to achieve 100% completeness in the study area. The accurate and complete MCH handbooks can help as a tool not only for future research but also for monitoring the intervention programs for the improvement of pregnancy outcomes.

5.2.2 Recommendations for future research

Further research is needed to elucidate the relationship between adolescent pregnancy outcomes and health-seeking practices. We suggest a prospective cohort study with a large sample size that includes information about potential risk factors of adverse pregnancy outcomes such as maternal height, maternal weight gain during pregnancy, genital tract infection, pregnancy complications (e.g. pregnancy induced hypertension and premature rupture of membrane, and anemia), and socio-economic factors such as marital status, economic conditions, and family support to confidently

conclude the effects of health-seeking practices on outcomes of adolescent pregnancy. Also, access to quality antenatal and delivery care will also need to be considered as one important factor to determine the effects of maternal health care on pregnancy outcomes.

Our results provide a starting point to explore the reasons for relatively poor health-seeking practices of adolescent mothers. Qualitative studies focusing on health-seeking behavior of adolescent mothers should be conducted for more in-depth understanding. Such studies should take into account social problems encountered by adolescent mothers during pregnancy and delivery.

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APPENDICES

APPENDIX A

Figure A1 Map of Kanchanaburi

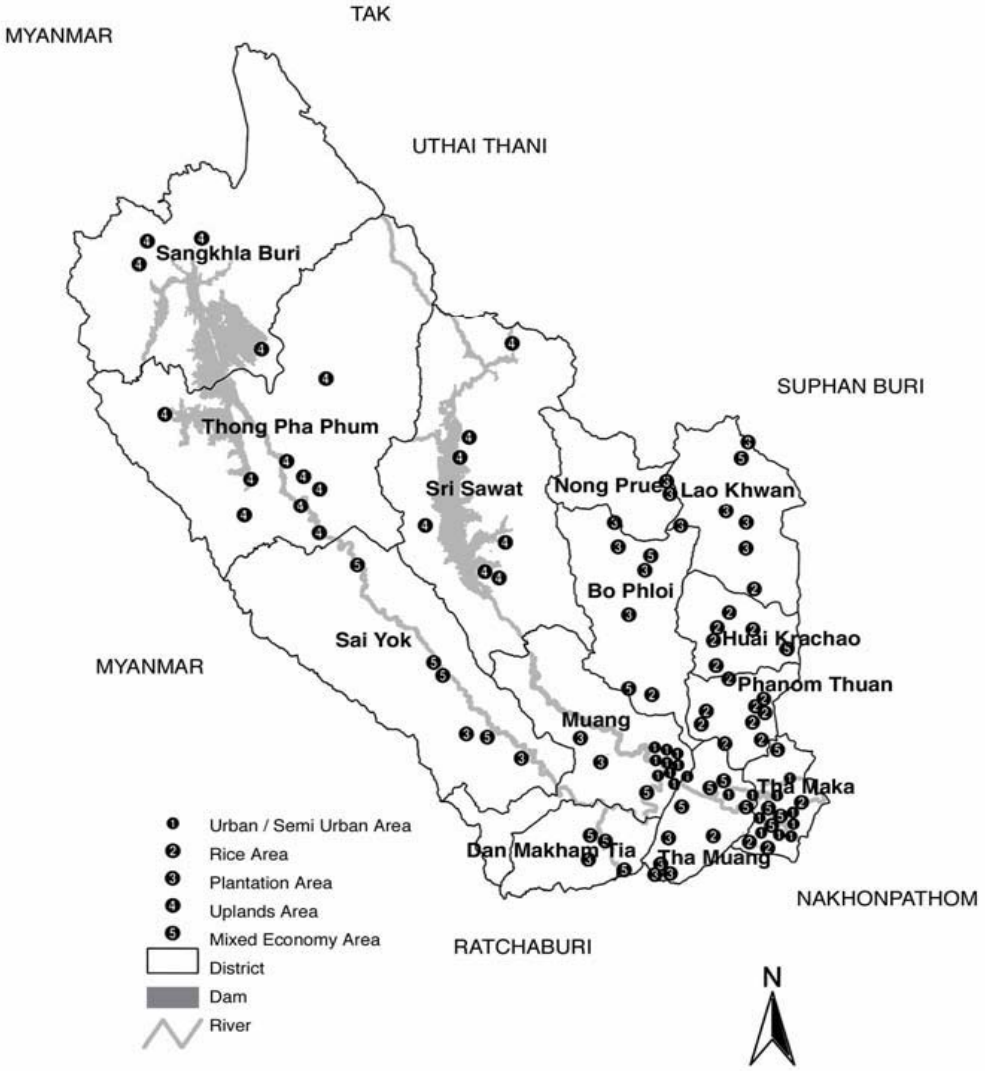

Figure A2 Map of Kanchanaburi and distribution of five strata in the study area

Table A1 Fertility at age 15-19, and total fertility of ASEAN countries, 2008

Country	Fertility at age 15-19 (births per 1000)	Total fertility rate (births per woman)	Fertility at age 15-19 as % of total fertility
Brunei Darussalam	27	2.3	6%
Cambodia	43	3.4	6%
Indonesia	39	2.2	9%
Lao PDR	71	3.2	11%
Malaysia	13	2.6	3%
Myanmar	16	2.1	4%
Philippines	37	3.2	6%
Singapore	4	1.3	2%
Thailand	49	1.5	16%
Timor-Leste	41	6.5	3%
Viet Nam	23	2.1	5%

Source: United Nations Economic and Social Commission for Asia and the Pacific, Population Data Sheet, 2008

APPENDIX B

SELECTED QUESTIONS FROM SPBEL SURVEY

Name of respondent……..……...…….....

Name of head of household……..……..

House no....……Village no....……..Village name…...Tambol…….…….

District …….…….. Kanchanaburi

Residence 1. Municipality 2. Rural

SECTION (1) MOTHERS AND ANTENATAL CARE

No	Questions and Filters	Coding Categories
101	How old are you?	YEARS.....
102	How old were you when you gave birth?	YEARS.....
103	What is your (completed) education level?	NO EDUCATION 1 INFORMAL 2 PRIMARY 3 SECONDARY PLUS 4
104	Are you working for income?	YES…….……...…… 1 NO …… 2
105	How long was your pregnancy?	MONTH…….. WEEK……..
106	When you were pregnant, did you see anyone for antenatal care for this pregnancy?	YES…….……...…….. 1 NO …… 2

107	**IF YES:** Whom did you see?	DOCTOR 1 NURSE/MIDWIFE 2 TRADITIONAL BIRTH ATTENDANT 3 OTHER (SPECIFY) …… 4
108	Where did you receive the antenatal care? ***RECORD ALL PLACES***	GOVERNMENT HOSPITAL (specify name)…… 1 PRIVATE HOSPITAL (specify name)…… 2 PRIVATE CLINIC (specify name)…… 3 HEALTH CENTRE 4 TRADITIONAL BIRTH ATTENDANT 'S HOME 5 OTHER (SPECIFY)…… 6
109	How many months pregnant were you when you first saw someone for antenatal care?	MONTHS ……..…. ☐☐ WEEK ……..…… ☐☐ CAN NOT REMEMBER …… 97
110	How many times did you go to antenatal care during this pregnancy?	NO. OF VISITS ……..…… ☐☐ CAN NOT REMEMBER…… 97

SECTION (2) DELIVERY

No	Questions and Filters	Coding Categories
201	Where did you give birth?	GOVERNMENT HOSPITAL (specify name)…… 1 PRIVATE HOSPITAL (specify name)…… 2 PRIVATE CLINIC (specify name)…… 3 HEALTH CENTRE…… 4 TRADITIONAL BIRTH ATTENDANT'S HOME…… 5 OTHER (SPECIFY)…… 6
202	Who assisted with the delivery? *Anyone else?* **PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS ASSISTING.**	DOCTOR 1 NURSE/MIDWIFE 2 TRADITIONAL BIRTH ATTENDANT 3 OTHER (SPECIFY) …… 4

SECTION (3) THE BORN BABY

No	Questions and Filters	Coding Categories
301	**INTERVIEWER:** Check condition of the baby on delivery?	**LIVING CHILD** **0001** LIVEBIRTH WHO DIED IMMEDIATELY AFTER DELIVERY **0000** MINUTES AFTER DELIVERY ☐☐☐☐ FEW HOURS AFTER DELIVERY ☐☐☐☐ DAYS AFTER DELIVERY ☐☐☐☐ MONTHS AFTER DELIVERY ☐☐☐☐ CAN NOT SPECIFY
302	How old is the baby? (current age of child)	AGE YEARS ☐☐ MONTHS ☐☐ DAYS ☐☐
303	Was the (name/stillbirth) weighed within 24 hours of birth?	YES ……..…… 1 NO …… 2
304	How much did the baby weigh (in grams)?	**- GRAMS FROM** RECALL …… ☐☐☐☐ **- GRAMS FROM** MCH BOOKLET …….. ☐☐☐☐ - LOST MCH BOOKLET…… **9997**
	Problem in the first month	
305	Now I'd like to talk about other problems that might have happened to **the baby in the first month** and tell me if this happened to your baby?	

	YES	NO	IF YES, WHERE DID YOU RECEIVED TREATMENT
1. Stopped feeding	1	2	☐
2. Weak suckling	1	2	☐
3. Stopped crying	1	2	☐
4. Body stiffness	1	2	☐
5. Convulsions	1	2	☐
6. Stone eyes	1	2	☐
7. No response (can't be waked/dizzy)	1	2	☐
8. Bulging fontanel	1	2	☐
9. Tetanus	1	2	☐
10. Yellow eyes and skin	1	2	☐
11. Took phototherapy	1	2	☐
12. Exchange transfusion	1	2	☐
13. Had blood transfusion	1	2	☐
14. Bleeding per rectum	1	2	☐
15. Bleeding from mouth	1	2	☐
16. Oozing umbilicus / pus from umbilicus	1	2	☐
17. Bleeding umbilicus	1	2	☐
18. Had fever	1	2	☐
19. Areas of skin that were red and hot	1	2	☐

	YES	NO	IF YES, WHERE DID YOU RECEIVED TREATMENT
20. Had skin rash (eruptions) with pus	1	2	☐
21. Waterery stools > 3 days	1	2	☐
22. Had vomiting and diarrhea	1	2	☐
23. Had bloodin the stools	1	2	☐
24. Slow breathing	1	2	☐
25. Fast breathing	1	2	☐
26. Fast breathing which sounds like phlegm	1	2	☐
27. Cyanotic lips	1	2	☐
28. Stop breathing and start again	1	2	☐
29. Retracted chest while breathing	1	2	☐
30. Continuous cough	1	2	☐
31. Abnormal skin colour (If YES, mention colour)……...	1	2	☐

305: WHERE DID YOU RECEIVE THE TREATMENT? : CODE

1. Government hospital 2. Private hospital 3. Private clinic
4. Health centre 5. Drug store 6. Traditional doctor/ herbal doctor
7. Self care 8. Do not receive the treatment 9. Other (specify)

306	Did you notice anything important about the baby **(in the first month)** I haven't asked you about?	YES. BABY ABNORMAL ……..	1
		NO, BABY NORMAL……..	2
		DID NOT NOTICE……..……	9
307	What have you noticed?	……..……..….	
		……...…….	

308: WHERE DID YOU RECEIVE THE TREATMENT? : CODE			
1. Government hospital 2. Private hospital 3. Private clinic 4. Health centre 5. Drug store 6. Traditional doctor/ herbal doctor 7. Self care 8. Do not receive the treatment 9. Other (specify)…….			
309	Was he/she admitted to the hospital?	YES……..……	1
		NO…….	2

The record of new born from the MCH booklet for the information of birth weight of baby

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Record of New Born

(To be recorded by health personnel only)

Date of birth.....Sex.....Birth weight.....grams.

Height.....cms. Head circumferrence.....cms.

Method of delivery ◯ normal ◯ abnormal (specify).....

Apgar score (1 minute).....(5 minutes.).....

Congenital Anomaly. ◯ Yes (specify).....

◯ No

Health condition at birth (during admission to hospital).....

.....

.....

Vitamin K injection ◯ Yes ◯ No

Infant screening ◯ Date..... ◯ Did not screen

- Test for Thyroid hormones ◯ Normal ◯ Abnormal

◯ Did not test

When you see these signs and symptoms in the child, you should immediately take him/her to see the doctor or health personnel.

1. Jaundice (Yellow eyes and skin)
2. High body temperature, fever, and drowsiness.
3. Breathe more than 60 times per minute or suffer from asthma.
4. Swelling, red skin, have pus in the umbilical cord, eyes or skin.
5. Not suckling.
6. Diarrhea, and /or vomiting.
7. Does not urirate.

Source: Mother and Child Health Handbook, Ministry of Public Health, 2005

BIOGRAPHY

NAME	Myitzu Tin Oung
DATE OF BIRTH	15 June 1978
PLACE OF BIRTH	Mandalay, Myanmar
INSTITUTIONS ATTENDED	Bachelor of Medicine and Bachelor of Surgery (M.B., B.S) Institute of Medicine, Mandalay, Myanmar 2005 Master of Arts (Population and Reproductive Health Research) Institute for Population and Social Research Mahidol University Thailand 2010
SCHOLARSHIP RECEIVED	WHO (Special Programme of Research, Development and Research Training in Human Reproduction)
POSITION AND OFFICE	Research Officer Medical Statistics Division Department of Medical Research (Upper Myanmar)