ABSTRACT

WISCONSIN HMONG REFUGEE PERINATAL BEHAVIORS AND INFANT OUTCOMES: ANALYSIS OF TRENDS AND DISPARITIES

By Tricia A. Promer

There is a lack of information on the perinatal behaviors of Hmong women. It is not documented whether there have been changes over time or whether there are health disparities in this population compared to the dominant Caucasian population. Changes over time could indicate the acculturation process regarding perinatal versus prenatal.. Wisconsin, being one of three states with a large Hmong population, was chosen for analysis. Descriptive statistics were gathered from the Wisconsin Interactive Statistics for Health (WISH), which is data derived from the Wisconsin Birth Records, along with available data from state birth record data from the Wisconsin Bureau of Health Statistics (both of which are population data and not sample data) and Wisconsin Women Infants and Children (WIC) data base reports are reported. These are analyzed in light of a review of literature on Hmong specific perinatal behaviors. Additional demographic data from infant mortality statistics and the U.S. Census demographic data are integrated into the analysis. Sr. Callistra Roy's Adaptation Model provides the theoretical framework for the study.

Trends were identified in the analysis of data from 1989 to 2008, comparing the Hmong population to the dominant Caucasian population were examined. Changes over time are noted, which may be related to acculturation regarding prenatal behaviors, which include the increase of tobacco use, decrease in alcohol consumption, seeking prenatal care earlier, and an increase in breastfeeding rates, after an initial drop following immigration. Some trends discovered involved infant outcomes, which showed an increase in low birth weight, NICU utilization with the tobacco increase, infant mortality over time, and neonatal mortality. These results suggest that, overall, the Hmong are acculturating and taking on both positive and negative behaviors of the dominant culture, and infant and neonatal outcomes have been affected.

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I would like to dedicate this project to my family. To my husband, Jeff and my three children, Jennifer, Tyler, and Hunter. Without their tremendous sacrifice, patience, and love, obtaining this degree and completing this project may not have been accomplished. To my mother, you have instilled in me the confidence and belief that all dreams are achievable. To my father, who use to say “education is the one thing that no one can take away from you.” Without the support and encouragement from my parents, family, and friends, I would not have been able to reach this dream. I would also like to thank my friends for their constant support and words of encouragement. Finally, I would like to express my sincere gratitude to Dr. Jill Collier. Your assistance and expertise in nursing and research made you a valuable asset to this project.

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CHAPTER I

INTRODUCTION

In the United States, a multitude of research studies have been conducted looking at infant morbidity and mortality of many different ethnic and racial groups. There has been a national agenda to examine health disparities in populations. There is national data on Asian population perinatal birth outcomes, but because of similar outcomes to the general population, this group has received little attention when health disparities are examined. Hmong people who are a subgroup of the Asian population are examined in this study. The Hmong came to the U.S. as refugees in two waves of resettlement and were primarily settled in three states -- Wisconsin, Minnesota, and California. This population of Hmong are examined to determine if there are disparities when compared to the dominant Caucasian population in Wisconsin, and whether there are trends over time indicating acculturation. There has been very little research reporting on or exploring whether prenatal behaviors and infant health outcomes have changed over time in new and established Hmong refugees, as they acculturate to the US. It is also unknown if the disparities exist in the Hmong population as they exist in other minority groups, such as the well documented disparities when African Americans are compared to Caucasians. Some of the lack of data is due to the fact that too much of the data collection views all who are Asian as one category, rather than identifying specific country, cultural, or language variations in the category of Asian people.

We know that health behaviors along with health outcomes will change over time as people immigrate into new cultures gaining access to healthy and unhealthy influences through a process of acculturation (Franzen & Smith, 2009; Mussap, 2008; Schaefer et al., 2009). As a first step in a complete analysis of acculturation affects in

Hmong childbearing women, the available literature and statistics on perinatal behaviors and birth outcomes needs to be reported, and gaps in knowledge need to be identified. The reporting of descriptive statistics is the first step toward a more complete analysis. This descriptive study will identify Hmong perinatal behaviors and birth outcomes compared to the dominant Caucasian behaviors and outcomes, and will analyze trends in the data, which may indicate acculturation.

The Hmong are an ethnic group that traditionally lived in the highland areas of Laos and Thailand. The Central Intelligence Agency (CIA) and U.S. Army recruited many Hmong during the Vietnam War. After the war, Laos fell to the communist Pathet Lao movement. There were thousands of Laos and Hmong who crossed the Mekong River into Thailand, where refugee camps were formed. There were two waves of immigration. During the first wave in the 1980's, approximately 10,000 Hmong refugees resettled. A second wave of refugees was resettled in the U.S. in the 2000's (Yau, 2005). Approximately 15,000 Hmong refugees from Laos were involved in the resettlement program, which began in February 2004. Eventually, nearly all of the Hmong refugees were resettled in third world countries, with the majority coming to the U.S. (Office of Global Health Affairs, 2004). There are approximately 7,700 Hmong now residing in the Green Bay-Appleton metropolitan area (Kornosky, Peck, Sweeney, Adelson, & Schantz, 2007). According to the 2000 census, there are 33,791 Hmong living in Wisconsin and 186,301 Hmong living in U.S. (Lipson & Dibble, 2008).

It is assumed that the Hmong are adjusting to the U.S. over time, as they gain new experience in the culture. They are attaining new behaviors and letting go of the old ones. These behaviors that are gained and abandoned can be positive or negative. This process is called acculturation. "Acculturation is a term that is often used to

indicate a group's progression, generally a minority group, of adopting cultural patterns of a host or dominant group" (Frazen & Smith, 2009, p. 174). These individuals are obtaining, maintaining, and abandoning the values, beliefs, and behaviors of their original culture (Frazen & Smith). This "refers to changes in identity, attitudes, values, and behaviors" that accompany an individual's movement from their original or "heritage" culture towards a new and different "mainstream culture" (Mussap, 2008, p. 532). The term acculturation is neither a negative or positive term. It is not a new concept. For many years, cultures have demonstrated acculturation. In more recent years, the Hmong population has demonstrated acculturation involving their transition in cultures, from their own independent community in Thailand to their current adjustment to the U.S. culture. This study looks specifically at the Hmong who resettled in Wisconsin.

What is Known About the Hmong Acculturation

Although the Hmong population in the U.S. is rapidly growing, knowledge relating to acculturation with the Hmong population related to prenatal care and maternal behaviors affecting infant outcomes is limited. Studies in other ethnic groups, such as Chinese, American Indians, and Alaska native Indians, have shown that maternal factors and behaviors of smoking cigarettes, drinking alcohol during pregnancy, limited prenatal visits, and decreased breastfeeding have contributed to poor infant outcomes of low birth weight, preterm births, and neonatal intensive care unit care (Kornosky et al., 2007; Johnson & Nowak, 2009).

According to Franzen and Smith (2009), Hmong families become more acculturated. First and second generation Hmong have been reported to consume less healthy American foods. Many studies indicate that the health and health behaviors of

all of the immigrants decline as they become acculturated to the American society (Chen, 2008). Some behaviors and lifestyles are changed as people enter new culture. For example with the Hmong, the rate of breastfeeding decreased from 94% and 88% in Lao and Thailand to only 11% for Hmong born in the U.S. (Kornosky et al., 2007). This is likely due to the availability of formula, and the means to acquire it, as they entered the U.S. and enrolled in recommended assistance programs such as Women Infants and Children (WIC), which supplies low income women with formula.

Earlier studies have also indicated that Hmong women had a low prevalence of smoking and alcohol consumption as they entered the U.S., which should improve their pregnancy outcomes; though their short stature, prenatal care practices, and socioeconomic disadvantage may increase their risk for poor pregnancy outcomes (Kornosky et al., 2007). The researchers found that prenatal care beginning in the first trimester was 60% for Hmong born, compared to the 12% prior to their immigration to the U.S. A study that was done in Minnesota from 1980 to 1982 found that the Hmong women did not smoke or consume alcoholic beverages (Erickson, Swenson, Ehlinger, Carlson, & Swaney, 1987). Although there is limited information related to acculturation with the Hmong population, the information presented does show changes within the Hmong culture over time after immigration to the U.S.

Behaviors Affect Birth Outcomes

Prenatal care is universally acknowledged as the hallmark of care for pregnant women, and it is commonly assumed to influence maternal behaviors and infant outcomes. Prenatal care, according to Anderson and Anderson (1994), is “the health care provided to the mother and fetus before childbirth (p. 849). According to Wisconsin Association for Perinatal Care (WAPC), perinatal care can be described as, relating to or

being the period around childbirth, including the 3 months before pregnancy and 1 year after birth (WAPC, 2009). Some of the most widely documented benefits for prenatal and perinatal care involve the maternal behaviors associated with the infant health outcomes. This study will examine both prenatal care and perinatal behaviors of Hmong women when compared to the dominant Caucasian population.

The four major maternal behaviors that are well researched related to birth outcomes are smoking, alcohol consumption, the number of prenatal visits with a provider, and breastfeeding prevalence. The March of Dimes (2009c) and others (Gillespie, Lyerly, & Zemke, 2009; Kim, England, Kendrick, Dietz, & Callaghan, 2009) summarize the available information, noting smoking is the leading cause of preventable sickness and death among pregnant women and infants. They summarize the consequences of smoking during pregnancy, noting it increases the risk for stillbirth, pre-term delivery, placenta abruption, and sudden infant death syndrome (SIDS). Studies indicate that maternal smoking is strongly related to low birth weight (LBW). In fact, 10.6% of all Wisconsin babies of LBW are born to women who smoked during their pregnancy, which compares to 6.3% of babies of LBW from non-smoking mothers (Gillespie et al., 2009; March of Dimes, 2009c; Kim et al., 2009). Because of the identified risks, "A goal of Healthy People 2010 is to decrease the percentage of women who smoke during pregnancy to 1.2%, but recent estimates indicate that more than 16% of pregnant women still smoke" (Kim et al., 2009, p. 893).

The second maternal behavior is alcohol consumption. Alcohol use during pregnancy can result in obstetric problems, miscarriage, or significant concerns with the fetus' health, including fetal alcohol syndrome (Feinberg, Wilton, & Gadacz, 2009). Wisconsin's cultural beer drinking habits are contributing to higher consumption of

alcohol and higher levels of concern from women during pregnancy. "Wisconsin continues to lead the nation in women of childbearing age who binge drink alcohol at 24% and the national average is 16%" (Feinberg et al., 2008, p. 1). The Centers for Disease Control and Prevention (CDC) (2009b) and the March of Dimes (2009b) gathers data from studies and advises women that when a pregnant woman drinks, so does her baby. There is no known safe amount of alcohol to drink while pregnant and there also does not appear to be a safe time to drink during pregnancy either. Therefore, both organizations recommend that women abstain from drinking alcohol at any time during their pregnancy (CDC, 2009b; March of Dimes, 2009b). The U.S. Department of Health and Human Services (USDHHS) (2009f) recognizes the importance of healthy behaviors in prenatal women. The Healthy People 2010 goal, Section 16-17, states to "increase abstinence from alcohol, cigarettes, and illicit drugs among pregnant women from 86% in 1997 related to alcohol to 94% in 2010. Cigarette smoking in 1998 was 87% and the goal for Healthy People 2010 is 99%" (USDHHS, 2009b, 2009f). According to a Minnesota study, Hmong mothers did not use alcohol prior to or during their pregnancies shortly after arrival in the U.S., while Caucasian mothers had a 33.9% rate of alcohol use in women of child bearing age (Erickson et al., 1987).

The third maternal behavior involves the number of prenatal visits. According to the March of Dimes (2009a), the purpose of perinatal care is to monitor the progress of a pregnancy and to identify potential problems before they become serious for either mom or baby. Expert opinion supports the use of prenatal care to positively influence birth outcomes (White, Frasier-Lee, Tough, & Newburn-Cook, 2006). Additionally, there are several non-randomized studies supporting prenatal care in Wisconsin women (Kornosky et al., 2007; Willems-Van Dijk, 2008). In her dissertation study of the impact

of prenatal care coordination on birth outcomes in Wisconsin, Willems-Van Dijk studied the Prenatal Care Coordination (PNCC) program of Medicaid, which offers women prenatal support. She found positive effects on women and infants in the Medicaid public assistance. The 6,210 women receiving PNCC services had an estimated costs savings of $1.5 million based on reduced costs, such as reduced prematurity and reduced neonatal intensive care unit (NICU) utilization, due to improved health outcomes of infants whose mothers were provided this enhanced prenatal care service. Because of both expert opinion and these types of studies, Healthy People 2010 has set a goal for 90% of women to obtain early and adequate prenatal care for 2010 (USDHSS, 2009a, 2009c). While it is seen as an important intervention, it was a new concept for the Hmong refugees. In early research on Hmong women in Green Bay, Wisconsin, only about 16% of the Hmong mothers began prenatal care in the first trimester of pregnancy, compared to 44% of the Caucasian women (Erickson et al., 1987).

The fourth perinatal behavior is breastfeeding. Johnson and Nowak (2009) summarize the current research, indicating that the breastfeeding mother has the ability to produce antibodies that protect an infant from diseases and can protect the infant against several non-contagious diseases that develop later in life. They additionally summarize studies indicating that there is an unclear relationship between breastfeeding and infant mortality (Johnson & Nowak). Many studies do find important health outcomes from breastfeeding, including decreased obesity and decreased diabetes (James & Lessen, 2009; Johnson & Nowak, 2009; Romano & Goer, 2008). Because of the health effects of breastfeeding, Healthy People 2010 sets a goal to increase the proportion of women who breastfeed, at all, for 6 months, and at 1 year to 75%, 50%, and 25%, respectively (USDHHS, 2009e). It is known that in Hmong women,

breastfeeding decreased when migrating from Laos and Thailand to the U.S. (Kornosky et al., 2007)

Birth Outcomes

Four important birth outcomes are gestational age at birth, birth weight and whether the infant was transferred or referred to a NICU for care, neonatal mortality (within 28 days), and infant mortality (from birth to 1 year). This study will evaluate the trends in these indices.

All four outcomes, infant prematurity, NICU utilization, infant mortality, and neonatal mortality have been correlated with the increase in smoking during pregnancy. Gillespie et al. (2009) examined the evidence and summarized that prenatal smoking increases preterm delivery, low birth weight, and infant mortality. The CDC (2009a) also summarizes known data, concluding the NICU care related to birth concerns is related to women smoking and using alcohol during their pregnancy. They also note that women who smoke during pregnancy put themselves and their unborn babies at risk for other health problems, which increases the dangers of premature birth, certain birth defects, and infant death (USDHHS, 2009d).

The March of Dimes Association summarizes data on alcohol intake and pregnancy, indicating that drinking alcohol while you are pregnant can cause your baby to be born with physical and mental birth defects (March of Dimes, 2009b). Because of this, Healthy People 2010 set a goal to "reduce fetal and infant deaths from 6.8% in 1997 to 4.1%, reduce preterm births from 11.6% in 1998 to 7.6%, and reduce low birth weight (LBW) and very low birth weight (VLBW) from 7.6% in 1998 to 5.0%" (USDHHS, 2009g).

The perinatal behaviors and infant outcomes of NICU utilization, low birth weight and, prematurity demonstrate a relationship to the mortality of the infant. According to the 2007 *Wisconsin Births and Infant Deaths* report through the Wisconsin Department of Health Services (WDHS) (2008), 469 infants under the age of 1 year died in 2007. The mortality rate was 6.4 per 1,000 live births in Hmong women in 2006, compared to 6.5 per 1,000 in 1997 for all ethnicities. A decade later in 2007, the Caucasian infant mortality rate was 5.3 deaths per 1,000 births, compared to 4.9 per 1,000 births in 2006 and 5.5 per 1,000 births in 1997, showing variability. In this report, the infant mortality rates in the Laotian/Hmong populations are not all reported for these single year categories (WDHS, 2008). In 2005 – 2007, the Laotian/Hmong infant mortality rate was 7.6 per 1,000 births, compared to 6.0 per 1,000 births in 2001 -- 2003. The *Wisconsin Births and Infant Deaths* (WDHS, 2008) report also documented that there were 292 neonatal deaths in 2007. This same document reported neonatal mortality rate in 2007 was 4.0 per 1,000, compared to 4.3 per 1,000 in 2006, 4.5 per 1,000 in 2005, and 4.4 per 1,000 in 1997 overall in all ethnicities (WDHS). According to Morrow, Chavez, Giannoni, and Shah (1994), "Asians have a slightly lower infant mortality rate than do Whites" (p 1497), but this includes all Asians with differing socio-economic status and differing time in the U.S. culture -- from being native born U.S. citizens to those who are new refugees, such as the Hmong.

Although there were studies on factors that influence the relationship between prenatal maternal behaviors and infant health outcomes, there are limited resources that relate acculturation to prenatal maternal behaviors and infant outcomes.

Significance to Nursing

Prenatal care and the relationship of maternal behaviors influencing the health of the infant are important indicators of the health of the population. Healthy birth outcomes are important for those families involved and benefit society. Prevention is the first priority of nurse practitioners, and influencing health behaviors is an important part of work as a nurse practitioner. Wisconsin Association of Perinatal Care (WAPC), March of Dimes, CDC, and Healthy People 2010 are just a few organizations that have identified perinatal and prenatal care as important to influencing maternal and infant outcomes. A limited amount of research has been noted indicating prenatal care concerns relating to the acculturation of Hmong refugees.

The U.S. is considered the “melting pot” due to the diversity of cultures that are represented. Wisconsin is no different. There are several ethnic groups that reside in the state of Wisconsin, from African Americans, Caucasians, American Indians, and Hispanics to Asians, Bosnians, and Somalians, to mention a few. There are noted health disparities in mortality rate in racial minorities in Wisconsin. Healthcare providers need to be aware of the changing cultural trends, as ethnic groups continue to relocate in the U.S. and, more specifically, in Wisconsin. In relation to the Hmong population and relocation since the 1970’s, over 130,000 Hmong refugees have relocated to the U.S. Wisconsin, Minnesota, and California are the states that contain the highest number of Hmong residents (Kornosky et al., 2007). Further research is needed to provide evidence of the acculturation related to perinatal behaviors and infant outcomes, so that healthy behaviors can be encouraged and unhealthy changes discouraged in primary care visits.

Statement of the Problem

Research indicates that there are several variables that influence infant outcomes. It is well known that maternal behaviors affect infant outcomes. There is little data reported on the perinatal behaviors of Hmong refugees in Wisconsin that affect birth outcomes, or on the birth outcomes themselves compared to the dominant culture, to determine if there are health disparities. There is also little research indicating a difference in the new Hmong refugees and the established Hmong refugees relating to maternal behaviors and infant outcomes.

Purpose of the Study

The purpose of this study is to: (a) describe trends in behaviors of prenatal Hmong women over time and to determine if there are disparities when compared to the dominant Caucasian population in the prenatal behaviors of tobacco consumption, alcohol consumption, prenatal visits, and breastfeeding; (b) describe the trends in infant outcomes over time and to determine if there are disparities when compared to the dominant Caucasian population, infant outcomes of NICU utilization, birth weight, gestational age, infant mortality, and neonatal mortality; and (c) determine trends over time related to the prenatal behavior and infant outcomes. Age will be examined as a factor.

The information from this study can provide the advanced practice nurse (APN) with a better understanding of behaviors and outcomes related to prenatal care when caring for the new and established Hmong refugees.

Research Questions

The research questions are:

1. What is the difference between Hmong refugees related to perinatal behaviors and infant health outcomes and the dominant culture?
2. Are there trends that can be identified in the data, and in light of the review of the literature, that indicate changes over time in Hmong perinatal behaviors and infant outcomes?

Definitions of Terms

Conceptual Definitions

Caucasian: Pertaining to a person whose ancestors were believed to have in ancient times inhabited the geographic region of the Caucasians in Southeastern Europe, or whose ancestors were members of the hypothetical Indo-European cultures indentified with the Caucasian (Anderson & Anderson, 1994, p 187).

Hmong: People who settled in the mountainous regions of Southwestern China and Northern Southeast Asia (Helsel, Petitti & Kunstadter,1992).

Laotian: People who settled in Southeast Asia (Morrow et al., 1994).

Asian American: Chinese, Filipinos, Koreans, Asian Indians, Japanese, Vietnamese, Cambodians, Laotians, Hmong, and Thai (Morrow et al., 1994).

Perinatal care: Preventative care for pregnant women, being the period around childbirth, including the 3 months before pregnancy and 1 year after birth (WAPC, 2009).

Prenatal care: Care you get while you are pregnant provided by a doctor, midwife or other health care professional (March of Dimes, 2009a).

Infant Health Outcomes

Birth weight: The measured heaviness of a baby when born (Anderson & Anderson, 1994, p.136).

Low birth weight: Less than 2500g (5.5 pounds) at birth. (Baldwin et al., 2009, p. 639; Schlenker & Ndiaye, 2009; Wisconsin Interactive Statistics for Health [WISH], 2009).

Prematurity: Less than 37 weeks gestation (Schlenker & Ndiaye, 2009; WISH, 2009).

Neonatal Intensive Care Unit (NICU): A hospital unit containing a variety of sophisticated mechanical devices and special equipment for the management and care of premature and seriously ill newborn infants (Anderson & Anderson, 1994, p. 708).

NICU utilization: Whether the infant was treated in a Level 3 neonatal intensive care unit, either in the birth hospital or in a hospital to which the infant was transferred from the birth hospital (WISH, 2009).

Neonatal mortality: Infant deaths that occur before 28 days of age (WISH, 2009).

Infant Mortality: The number of infant deaths per 1,000 live births during the year (WISH, 2009).

Maternal Behaviors

Prenatal care: The health care provided the mother and fetus before childbirth (Anderson & Anderson, 1994, p. 849).

Alcohol: A clear, colorless, volatile liquid that is miscible with water, chloroform, or ether, obtained by the fermentation of carbohydrates with yeast (Anderson & Anderson, 1994, p. 39).

Acculturation: Changes in identity, attitudes, values and behaviors that accompany an individual's movement from their original or "heritage" culture towards a new and different "mainstream" culture (Mussap, 2008, p. 532).

Trimester Prenatal Care Began:

First Trimester: One to 3 months.

Second Trimester: Four to 6 months.

Third Trimester: Seven to 9 months.

No Prenatal Care: No prenatal care documented on the birth record.

Operational Definitions

Low birth weight: Weight less than 2500g.

Prematurity: Gestational age less than 37 weeks.

Neonatal Intensive Care Unit (NICU): Participant was admitted to the NICU as indicated on the birth certificate data, which is reported in WISH.

Prenatal visits: Number of times participants see providers.

Prenatal smoking: Participant smoked prenatally, as reported on the birth certification.

Prenatal alcohol: Participant drank any alcohol prenatally.

Assumptions

General assumptions that pertain to this research study indicate:

1. Participants responded honestly when asked questions for each of the points of data collection.
2. Data collection by health personnel on birth certificates is accurate.

3. Wisconsin Infants and Children (WIC) data on Asian populations is assumed to be representative of the Hmong, given their immigrant status and initially low income, large numbers in the state, and known participation in WIC.
4. Acculturation exists and impacts populations.

Chapter Summary

The purpose of this study was to describe the behaviors of Hmong refugees over time and Hmong infant outcomes compared to the dominant Caucasian culture. Attention will be paid in the analysis to the waves of Hmong immigration. It is known that many Hmong who have left their homeland and migrated to the U.S. have changed their behaviors during pregnancy. This study will seek to describe those changes by examining trends in data.

Researchers have investigated acculturation among other cultures and suggest that the health and health behaviors of immigrants deteriorate as they become acculturated to U.S. society (Chen, 2008). It would be assumed that with state-of-the-art care provided, availability prenatal care, and improved availability of services, that health of immigrants from poor countries and refugee camps would see improvements in infant outcomes. This study will examine the data to determine the trends over time. The infant outcomes data will be analyzed to determine if any changes identified have had an effect on infant outcomes.

In Chapter II, the theoretical framework used for the study and a review of the literature are presented. This review of literature will provide background on the theoretical framework, acculturation, perinatal behaviors, and the Hmong.

CHAPTER II

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Introduction

The purpose of this study is to describe the behaviors of Hmong refugees over time and Hmong infant outcomes compared to the dominant Caucasian population. In this chapter, the theoretical framework for the study and the review of literature are described. Sr. Callista Roy's Adaptation Model (McEwen & Willis, 2007) and its congruence to the study will be explained. A review of information related to acculturation and known information about Hmong perinatal behaviors and birth outcomes is reviewed.

Theoretical Framework

The framework used in this study was Roy's model of adaptation (1999) (McEwen & Willis, 2007). Roy related adaptation to humans being viewed as biopsychosocial groups who are constantly confronted with environmental changes (McEwen & Willis, 2007). When individuals are not coping with their environmental changes, it can create ineffective coping mechanisms that result in maladaptation. Roy describes that both innate and acquired characteristics can assist with the adaptation process (Roy & Roberts, 1981). Roy identifies four modes essential for adaptation, which are: physiologic-physical, self-concept-group identity, role function, and interdependence. Through the four modes, Roy believes one can observe responses and interactions with the individuals and the environment to determine adaptation (Roy &

Roberts, 1981). In this study a modified model is presented to improve the applicability to this study. In the modified model presented in Figure 1, the term *physical response* is used for the first mode of adaptation. The terms *values* and *morals* are used for the second mode of adaptation. The term *expectations* is used for the third mode of adaptation, and for the fourth mode of adaptation, the term *relationship* is used. This description is used to better represent the adaptation described in this study.

The physiologic mode allows individuals to react physically to their environment. There are five basic physiologic needs and four regulator processes. The physiologic needs include activity and rest, nutrition, elimination, oxygenation, and protection. The regulator processes involve the senses, fluids and electrolytes, neurologic functions, and endocrine function. The way the individual responds to the environment in a physical manner determines adaptation (Roy & Roberts, 1981). In this study, the application of theory uses the term *physical response* for the first mode of adaptation.

Self-concept mode involves psychological and spiritual integrity of oneself. Self-concept relates to feelings, experiences, view of oneself, expectations, and values related to moral-ethical-spiritual views. Self-esteem is also a concept related to self-concept, which can be defined as how an individual perceives their self worth (Roy & Roberts, 1981; Meleis, 1997). In this study, the application of theory uses the terms *values* and *morals* for the second mode of adaptation.

Role function can be described as a set of expectations of an individual toward another individual. Roy classifies roles as primary, secondary, and tertiary. Primary roles are based on age, sex, and development. Secondary roles are acquired with developing relationships with others and making them permanent. Tertiary roles can be described as activities that are more temporary (Roy & Roberts, 1981; Meleis, 1997). In

this study, the application of theory uses the term *expectations* for the third mode of adaptation.

The fourth mode, interdependence, is related to the close relationship of others expressed in the ability to love and to be loved, to respect and to be respected, and to value and to be valued (Roy & Roberts, 1981; Meleis, 1997). In this study, the application of theory uses the term *relationship* for the fourth mode of adaptation.

These four modes are essential when assessing adaptation. Roy and Roberts (1981) also describes three types of stimuli that can influence these modes. The specific adaptation level can be identified by the effect of the three levels of stimuli. The first type of stimuli is focal stimuli, which refers to those that are immediate in an individual's life. The second type of stimuli is residual stimuli, which consists of attitudes and previous experiences. The third type of stimuli is contextual stimuli, which pertains to all other stimuli. This stimulus would incorporate the individuals' beliefs, attitudes, experiences, and values that are not measurable. One example would include an individual's irritation with a noise someone makes relating to pain. It is the person's perception of the noise that makes it bothersome (Roy & Roberts, 1981; Meleis, 1997).

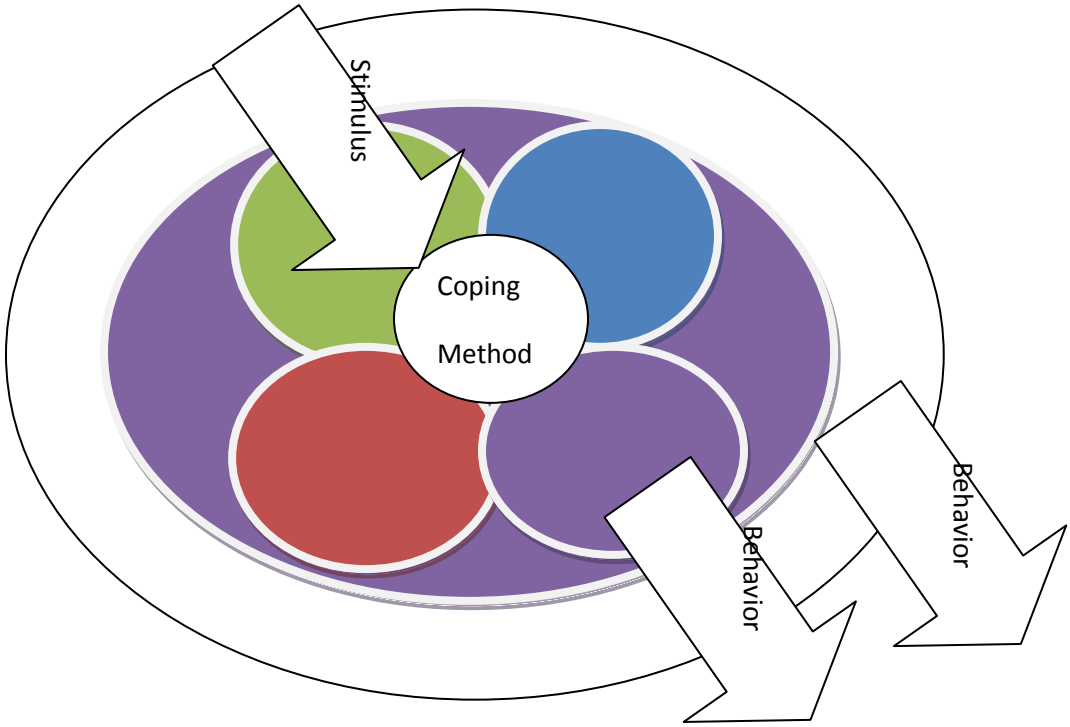
In summary, Roy's adaptation model describes an individual as a biopsychosocial human being that is in constant interaction with environmental changes. Individuals adapt to change in the environmental stimuli through the four adaptive modes. If the behavior that an individual has is adaptive, that may result in higher level of functioning, whereas if the behavior is maladaptive, that may result in a lower level of functioning. Coping modes and methods are unobservable, only the responses that are made can be considered observed.

First mode:

Physical response

Second mode:

Values and morals



Third mode:

Relationship

Fourth mode:

Expectations

Figure 1. Adaptation Process: My Application of Roy's Adaptation Theory.

As the Hmong refugee women have migrated out of their country, they have altered many prenatal behaviors. Some of those prenatal behaviors include smoking, alcohol consumption, healthcare appointments (prenatal visits), and decisions to breastfeed. The change in these behaviors may be an observed coping response to a change in their environment. Underlying beliefs and unidentified responses to environmental stimuli lead to changes in behavior of anyone, but in the Hmong who experienced extreme changes, some dramatic adaptation would be expected. This is witnessed in the changes in breast feeding noted in the review of literature, as Hmong women experience the freedom of the availability of formula in the U.S.

Review of Literature

There is a plethora of information on the utility of prenatal care, on the virtue and evidence that women should not smoke during pregnancy, and on the evidence that women should abstain from alcohol during pregnancy. A review of literature for all of these behaviors, and the health affects, is beyond the scope of this paper and at this point is considered known information. This data were summarized in the introduction. A review of related information on acculturation and known information about Hmong perinatal behaviors and birth outcomes will be the focus of this study.

Perinatal Behaviors

According to Helsel et al. (1992), the most recent wave of Southeast Asian immigrants started in 1975 with the Hmong, who were agricultural people who lived in relatively remote villages in the mountains of Southwestern China and northern Southeast Asia. Their prenatal behaviors were affected by their previous experience with prenatal care. The Hmong women, when arriving in the U.S., were unlikely to use tobacco or alcohol. They were also known for late prenatal care, low socioeconomic

status, and low birth weight for infants. Helsel et al. (1992), studying Hmong in Merced and San Joaquin counties in the Central Valley of California between 1985 and 1988, report the Hmong birth weights of less than 2500 grams, 4.6% compared to the Caucasian rate of 3.9 % (1992). This study also presented information regarding timing of prenatal care. Caucasian women had a 71.9% rate of those who began prenatal care by 3 months, and the Hmong rate was considerably lower at 34.4% (Helsel et al., 1992).

Regarding perinatal care and infant mortality, Morrow et al. (1994) documented the results of a study done in California on births in California. This study specifically examined Asian as a group, which included Filipino, Chinese, Vietnamese, Korean, Laotian, Japanese, Cambodian, Thai, and other Asian. They studied data from birth records that were obtained during 1982 and 1987 in California. The researchers also found that the neonatal mortality rate was significantly lower in the Asians as a group (26.7%) compared to the Caucasian population (21.0%).

Infant mortality rate in Caucasians was 7.6 per 1,000 compared to Hmong (identified as Laotian in this study) at 8.3 per 1,000. It is unclear if some of the Hmong would have been identified as Thai. This group had an even higher infant mortality rate at 9.4 per 1,000. The Hmong in this study had worse outcomes than all Asians combined and also higher than other Asian subpopulations which ranged from 5.1 per 1,000 (Japanese) to 6.8 per 1,000 (Filipino). While Asians overall had lower rates than Caucasians, the Hmong, who are recent immigrants to the U.S., had higher infant mortality.

In this study, Morrow et al. (1994) also found that prenatal care seeking in the first trimester was lower than the overall population for the Asian group, and there was also a higher proportion of women who received no prenatal care. Morrow et al. found a

higher rate of early prenatal care than the Helsel et al. (1992) study, but still found disparity in first trimester prenatal care for Laotians (53.3%), compared to the Caucasians (81.8%). Other than the Cambodians, who are also recent immigrants, who had first trimester prenatal at similar rates as the Hmong, the remaining Asian groups trimester prenatal care ranged from 70% to 85%. This is pertinent to the current study, as it directly compares Laotian women to Caucasian women in a large population of Californians and shows that those who immigrated more recently have differing rates of use of healthcare services, such as prenatal care. This study also reported a higher rate of low birth weight (birth weight of less than 2500 grams) in the Laotian population -- 5.6% compared to the Caucasian rate at 4.2%. While direct causation of prenatal care to improved outcomes is difficult to prove, expert opinion supports that prenatal care is an important factor, which Morrow et al. (1994) also hypothesized.

Another study, Hopkins and Clarke (1983), investigated pregnancy risk in the Indochinese refugee population and found that low birth weight among the Hmong was 9.9% compared to the Caucasian rate of 6.9%. This study also examined the rate of Hmong who began prenatal care in the third trimester. The Hmong rate was 34.8% compared to the Caucasian rate of 5.1% (Hopkins & Clarke).

Acculturation

Acculturation related to prenatal care is an important topic of research, because it relates to the health of women, as well as the health of infants. The hope is for new immigrants to gain the benefits of the new culture's opportunities, while retaining the benefits of their cultural practices. There are studies that indicate the benefits of increased use of health services, such as prenatal care to improve maternal/infant outcomes and decrease maternal/infant concerns (Kornosky et al., 2007; White, et al.,

2006; Willems-Van Dijk, 2008). However, it is not known if there are other changes in practices that neutralize the benefits.

Among many cultures and ethnic descents, a cultural shift can occur when relocating to another country. Examining factors associated with health behaviors regarding physical exercise and dietary intake of Chinese women, who have migrated to the U.S. (Chen, 2008), were studied in a total of 65 Chinese-American children and mothers. Measurements included weight, height, level of physical activity, and dietary. Mothers completed questionnaire's regarding income, level of education, and acculturation. The results indicated that an intervention intending to decrease obesity and promote health behaviors needs to be appropriate for different ethnic groups and address levels of acculturation (Chen, 2008).

Kornosky et al. (2007) undertook a study with data obtained from an ongoing study on the impact of perinatal exposure to environmental chemicals. The authors examined data related to reproductive characteristics of Asian immigrants before and after migration. It was a cross-sectional analysis involving 141 couples of reproductive age residing in Green Bay, Wisconsin. The information was gathered from questionnaires. The results indicate that the percentage of Hmong seeking early prenatal care has increased since relocating to the U.S. The percentage of breastfed infants was found to be much lower for U.S. born infants than for those born in Laos or refugee camps, and very few women reported consumption of alcohol or smoking cigarettes. In fact, "2.1% of women classified themselves as current drinkers and no women reported smoking cigarettes" (Kornosky et al., 2007, p. 138.). If these health behaviors are consistent, health outcomes of Hmong pregnancies should show benefits in comparison to the dominant Caucasian population, as rates of drinking and drinking

during pregnancy are high in this population. In another study of acculturation, which provides some insight into health behaviors of women, Mussap (2008) studied acculturation, body image, and eating behaviours in Muslim Australian women. Berry's acculturation framework explained the four steps: integration, assimilation, separation, and marginalization. A 2-way MANOVA was used with four dependent variables of body dissatisfaction, disordered eating, internalization of the thin ideal, and self-esteem, with a sample size of 101 Muslim Australian women. The results conclude the potential concerns to body image incurred by women who follow Western beliefs, and the benefits in retaining cultural attitudes that promote a positive self image (Mussap, 2008). Eating behaviors are not specifically examined in this study; however, this dimension of acculturation could affect the health of women and nutrition, and health behaviors are part of the complex web affecting the health of women and infants.

In another study, Frazen and Smith (2008) focused on acculturation and how the environmental changes impact dietary habits among adult Hmong in St. Paul and Minneapolis, Minnesota. The sample size was 65 adult males. How acculturation, environmental factors, and food insecurity influence dietary behavior, body mass index, and health issues were studied. The results indicate that environmental changes and increased acculturation have negatively affected the weight and health of Hmong male adults (Frazen & Smith, 2008), and since Hmong generally eat as a family, these impacts are likely felt among the women, as well.

Another study, Schaefer et al., (2008), referring to acculturation, studied the relation of socioeconomic status on the tendency toward overweight in Asian American and Mexican American adolescent females. It was a cross-sectional study with 144 participants. The research showed an increased rate of obesity with years in the U.S.

and attributed the increase to changes in dietary practices and a decline in physical activity. These changes were correlated with increased acculturation (Schaefer et al., 2008).

Language acculturation and pediatric injury risk were discussed by Schwebel and Brezausek (2009). The study concluded that there are three reasons for increased injury as families become acculturated. This may be due to environmental issues, healthcare utilization, and the relationship to the culture. Sociologists and historians have stated that individuals acculturated in American/Western society are more likely to engage in independence (Schwebel & Brezausek, 2008).

Pregnancy behaviors in migrant workers were addressed relating to acculturation. This research was done by the CDC (1997) and reported in the Morbidity Mortality Weekly Report (MMWR), which evaluated data on prenatal care use, weight gain during pregnancy, and birth outcomes in relationship to acculturation. The results indicate that prenatal care may reduce the prevalence of LBW. Also, migrant women were less likely to have gained the recommended weight during pregnancy (CDC, 1997).

Infant Outcomes

Infant outcomes are influenced by maternal behaviors. The three infant outcomes to be discussed are gestational age, birth weight, and NICU. This review is in addition to the studies reviewed above (Morrow et al., 1999; Helsel et al., 1992) which reviewed prenatal care utilization along with infant outcome data.

A study by Public Health Madison Dane County analyzed the disappearance of the Black-White infant mortality gap (Schlenker & Ndiaye, 2009). By examining various sources of information, they found some possible explanations. There appeared to be a decline of smoking and an increase of high school graduation among blacks. An

increase of prenatal care was also occurring, as well as an increase in birth weight. The improved health outcomes were correlated with healthcare coverage, participating in prenatal programs, and other federally funded programs (Schlenker & Ndaiye, 2009).

Keeton and Hayward (2007) undertook a study to examine birth outcome related to race and age by studying a cross-sectional sample of 47,956 subjects to determine birth outcomes. Their research has linked unintended pregnancy with adverse prenatal outcomes like low birth weight, infant mortality, and NICU admission. Unintended pregnancy is not studied in the current study, but it is a factor that could be analyzed in the future. Related to the current study, poor infant outcomes were associated with tobacco use, alcohol use, receipt of prenatal care in the first trimester, total number of prenatal care visits, medical complications of pregnancy, and preterm delivery (Keeton & Hayward, 2007).

Sparks (2009) reports rates of preterm birth show ethnic groups with a variable rate of 10.7% (among Asians) to a high of 18.4% (African American), which are higher than reported rates in Caucasian populations, but seeks to determine the actual causes of the disparities. A long list of data on births was examined using multivariate statistics. The authors found many statistically significant variables in their study, but through multivariate statistics determined that when race stratified models were examined, the main factors determining outcomes were maternal health complications, and inadequacy in prenatal care accounted for the disparities in preterm birth (Sparks, 2009). Prenatal care rates are examined in this study.

There is additional research which suggests that increased access to and utilization of prenatal care will improve the birth outcomes (Lu & Halfon, 2003). Mothers of minority racial ethnic groups are more likely to receive inadequate prenatal care

(Sparks, 2009). The epidemiology related to preterm birth and neonatal outcomes was addressed, as well. According to Goldberg, Culhane, Iams and Romero (2008), preterm birth is the leading cause of perinatal morbidity and the mortality in developed countries. The rate of preterm births in the U.S. is 12% -- 13 % and 5-9% in many other developed countries; although, the rate has increased due to increased preterm births and preterm delivery of artificially conceived multiple pregnancies. Much of the increase is related to pre-eclampsia or eclampsia and intrauterine growth restriction. Other risk factors include infection, inflammation, vascular disease, periodontal disease, and low maternal body mass index (Goldberg et al., 2008). The studies have shown that very preterm deliveries have a strong relationship to neonatal mortality rates in developed countries with births before 33 weeks of gestation, which ranges from 35% and 70% of the neonatal deaths. The United Kingdom (UK) government health target is to reduce infant mortality rates by 10% by 2010. Neonatal mortality accounts for approximately 80% of the infant mortality in the U.K. It is assumed that the high neonatal mortality rate is due to the very preterm deliveries, and this accounts for the poor outcomes for the infants. The research exhibits a decrease of neonatal mortality in developed countries due to technology advances and intensive care. The majority of the deaths are attributed to preterm deliveries (Draper & Field, 2007).

The literature review addresses several issues. There was an over abundance of studies documenting perinatal behaviors associated with poor infant outcomes. The researchers stated that perinatal behaviors of smoking, drinking alcohol, and a decrease of prenatal visits increased poor maternal/infant outcomes, while an increase of breastfeeding improved the health outcomes of the infant. There was an enormous amount of material regarding the Hmong population and acculturation with reference to

obesity, but little regarding prenatal care and the outcomes and the acculturation process. There is a gap in literature related to the trends in perinatal behaviors and infant outcomes. Disparities in the infant outcomes between Hmong and Caucasians are reported, which are important outcomes related to this study.

Chapter Summary

The purpose of this study is to determine if there are trends in behaviors of perinatal Hmong women over time and to determine if there are disparities when compared to the dominant Caucasian population. In this chapter, the theoretical framework and a literature review were discussed. Roy's Adaptation Model was the theoretical framework for this study. Roy presented the theory identifying human beings as biopsychosocial groups that can be put into four subgroups where individuals respond and interact with the environment in order to adapt.

There have been several perinatal behavioral changes that have been discussed related to the time element of the arrival of the new Hmong refugees and perinatal behavioral changes related to the established Hmong refugees. Roy's model related adaptation to humans being viewed as groups who are constantly confronted with environmental changes (McEwen & Willis, 2007). When individuals, such as the perinatal Hmong women, are not coping with their environmental changes with transitioning to the U.S., it can create ineffective coping mechanisms that result in maladaptation, which can result in poor perinatal behaviors and can ultimately impact the health outcomes of the infants. As researchers have stated, these Hmong refugees were experiencing acculturation, as well as struggling with the change of many environmental issues with relocating from Laos to the U.S. Studies have identified that a

change in their environment has altered their perinatal behaviors by decreasing breastfeeding traditions, which can influence birth outcomes (Kornosky et al., 2008). Roy indentifies four modes that influence adaptation (McEwen & Willis, 2007). An example of the physiologic mode, involving basic needs to survive, could describe a perinatal women not getting enough sleep, therefore does not want to breastfeed her baby, or another example involving self-concept, which includes the perinatal women's values and morals -- she never saw a doctor for her pregnancy before, therefore did not believe it was necessary. Another study showed little relationship to an increase in alcohol and smoking behaviors due to environmental changes of relocating from Laos to U.S. (Kornosky et al., 2008). Roy's Adaptation Model also focuses on the four modes of physical response, values and morals, experiences, and relationship. All of these modes can affect the adaptation process related to the connection between perinatal care and infant birth outcomes. The overall theme represented by the literature review identified that increased acculturation leads to increased risk factors (Luecken, Purdom, & Howe, 2009).

In the following chapter, the research design, population and sample, data collection procedure, protection of human subjects, data analysis procedure, and limitations of this study will be described.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study is to determine if there are trends in behaviors of perinatal Hmong women over time and to determine if there are disparities when compared to the dominant Caucasian population. In this chapter, the research method is described, including the design, population and sample; data collection procedures; protection of human participants; data analysis procedures; and the study limitations.

Design of Research Study

The research design for this study was a descriptive, correlational, retrospective structured design. This study will look at behaviors of perinatal Hmong women over time and determine if there are disparities when compared to the dominant Caucasian population. The conceptual and operational definitions are included and presented in Chapter I.

Population, Sample, and Setting

The target population of this study is perinatal Hmong women compared to the perinatal Caucasian women. The time frame to identify trends over time and disparities is reflected in WISH system and Wisconsin WIC reports from 1989 -- 2008. All perinatal women are entered in the large sample from the WISH data base; only the Hmong and Caucasian women were the target groups for this study. Of the information involving Wisconsin WIC reports, only those enrolled in Wisconsin WIC are represented, and the reported numbers are for all Asian participants. The inclusion criteria for this study are

as follows: (a) pregnant Hmong and Caucasian women in WISH, which is derived from birth certificate data and state mortality data; and (b) Asian women in Wisconsin WIC. This is a comparison of the Hmong and Caucasian prenatal women related to perinatal behaviors and birth outcomes.

Data Collection Instruments

Data for this study will be collected from two sources -- WISH, which represents all births as a population rather than a sample, and is the information gathered for Birth Certification Records, and Wisconsin WIC pregnancy nutritional surveillance reports and state mortality data. Because this study examines the population as a whole for much of the data (all WISH data), all differences in data are considered to be real differences. In this case, a judgment on the clinical significance is made rather than a reliance on statistical significance, and trends are noted as to whether the trend is consistent over time rather than variable. All forms contain information relating to perinatal behaviors and infant outcomes. The WISH data base includes statistics involving prenatal visits, NICU utilization, smoking, birth weight, gestational age, and additional data that can be analyzed for infant mortality. The Wisconsin WIC reports include statistics on breastfeeding and alcohol consumption, which are gathered by WIC staff during visits.

Data Collection Procedures

Approval to conduct the study was granted from the University of Wisconsin Oshkosh Institutional Review Board (IRB). The study was granted as exempt. The researcher received a letter from the IRB. Data were collected from publicly available data bases and Wisconsin WIC pregnancy nutritional surveillance reports. The WIC

data are extracted from reports that present state data and were in completed form when accessed. No original extraction from data bases was done for the WIC data.

Data Analysis Procedures

Data were analyzed using descriptive, retrospective structure design to examine if there are trends in behaviors of perinatal Hmong women over time and to determine if there are disparities when compared to the dominant Caucasian population. Because the data from WISH is population data and not sample data, there are no standard deviation data reports.

Limitations

Limitations to this study included generalizations related to a large sample size. Other limitations included that the Wisconsin WIC pregnancy nutrition surveillance reports included information which was obtained from participants enrolled in Wisconsin WIC only. An additional limitation involved literacy with understanding the information and the accuracy of the correct response. A limitation related to all of the retrieval sites included possible inaccurate information due to the participants, as well as other healthcare providers, entering information. Additionally, the Wisconsin WIC data bases included information on all Asian participants, and specific data on Asian ethnicity is not collected.

Chapter Summary

For this study, a descriptive, retrospective structure design was used. A complete sample of all births in Wisconsin was examined from the WISH data system,

from birth records, and data from all participants in the Wisconsin WIC reports were used.

In the following chapter, the demographic description of the sample will be presented, results and discussion of the research findings, and how these can contribute to nursing and nursing research.

CHAPTER IV

FINDINGS AND DISCUSSION

Description of the Sample

According to the Census Report in 2000 (U.S. Census Bureau, 2008), the Asian population in the United States consists of 11 Asian groups, which includes Asian Indian, Cambodian, Japanese, Chinese, Filipino, Hmong, Korean, Laotian, Pakistani, Thai, and Vietnamese. Of these Asian descents, a few groups are considered as recent immigrants, these include Hmong, Vietnamese, and Laotians, which are reported as being 11.9 million people or 4.2% of the U.S. population. The census report has different ways to categorize certain groups. For example for Asians, the Asian only group represents 10.2 million people or 3.6%, and the group entitled Asian and one or more other races represents 1.7 million people or 0.6%. Data collection for the U.S. Census was done by race alone and race in combination. Throughout the U.S., the Asian population has increased from 1990 to 2000. The term Asian refers to people with heritage in the Far East, Southeast Asia, or Indian subcontinent (U.S. Census Bureau, 2009). There are several known names for the Hmong heritage that are used to describe the Hmong in the literature and in data sets. These are Hmong, Southeast Asian, Northern Southeast Asian, Laotian, and Asian/Pacific Islander.

The population data sets accessed throughout this study consisted of information from WISH and WIC reports. The WISH data set described Hmong population as Laotian/Hmong, and the WIC reports referred to Hmong as Asian /Pacific Islanders (A/PI), combining Asians and Pacific Islanders into one group. The Caucasian population was referred to in the WISH data report as non-Hispanic White, and Caucasians were referred to as White Not Hispanic in the Wisconsin WIC report. Each

data set had its own identifying indicators for the population that they were reporting information on. In this study, the White non-Hispanic population is referred to as Caucasians.

The WISH data report contained information on several perinatal behaviors and infant outcomes. The perinatal behavior information that was obtained from the WISH system included smoking status, prenatal care utilization, and age trends. The infant outcomes that were obtained through the WISH system included gestational age, prematurity, neonatal intensive care utilization, birth weight, infant mortality, and neonatal mortality. Due to the fact that data were gathered over time, trends over time are also examined. Wisconsin Interactive Statistics for Health data were retrieved from 1989 through 2008. The data that were obtained from the Wisconsin WIC reports contained information relating to perinatal behavior of breastfeeding and alcohol consumption in A/PI. The breastfeeding data was retrieved from 1997 through 2007 and the alcohol consumption data was retrieved from 2006 through 2007. All data reported are data on Hmong from Wisconsin.

The review also entails an analysis of data based on age. The WISH data were reviewed as those less than 18 years old included 15 to 17 years and under 15 years. For those that were 18 years of age and older, included 18 -- 19 years, 20 -- 24 years, 25 -- 29 years, 30 -- 34 years, 35 -- 39 years, 40 -- 44 years, and 45+ years.

When analyzing the data, it is helpful to have information on all births in Wisconsin. The total births for Wisconsin from 1999 -- 2006 are 1,396,881. The total Caucasian births are 1,118,550, and the total Hmong births are 22,494. Additional state level health statistics are provided as needed for interpretation of results in the section where it is needed.

Results

Perinatal Behavior

Perinatal behaviors of smoking, alcohol use, breastfeeding, and prenatal care can impact the infant outcomes. Data is presented with comparisons over time and by age. These behaviors play an important part in determining the infants' health risk.

Tobacco Smoking

The first behavior reviewed is tobacco smoking behavior. Table 1 is a comparison of smoking behaviors perinatally between Caucasian and Hmong women from 1989 -- 2007. Data were gathered from the WISH data base.

Table 1

Percentages of Tobacco Smoking Behaviors

	Percentage	
	Caucasian	Hmong
All		
1989 – 1995	21	0
1996 – 2000	18	1
2001 – 2005	15	3
2006 -- 2007	16	5
<18 years of age		
1989 – 1995	37	0
1996 – 2000	34	3
2001 – 2005	30	5
2006 -- 2007	28	5
>18 years of age		
1989 – 1995	21	0
1996 – 2000	17	1
2001 – 2005	15	3
2006 -- 2007	16	5

Table 1 shows an increase of smoking among the Hmong and a decrease of smoking among the Caucasians. From 1989 to 1995, the Hmong were not smoking, with 0% of Hmong reporting smoking during their pregnancy. These rates increased in 1996 to 2000 when 1% smoked; then in 2001 to 2005, 3% smoked; and in 2006 to 2007, 5% of the prenatal Hmong women smoked. Caucasian women who smoked in 1989 to 1995 was 21%; then in 1995 to 2000, the smoking rate dropped to 18%; then in 2001 to 2005, the rate decreased again to 15%; and between 2006 and 2007, the smoking rate for Caucasian women increased to 16%.

The table also shows age factors comparing smoking rates in those under 18 years of age to those that were 18 years of age and older between 1989 and 2007. For the Hmong who are less than 18 years of age, the rates of smoking increased. In 1989 to 1995, 0% smoked; and then from 1995-2000, the rate increased to 3%; and between 2001 -- 2005 and 2006 -- 2007, the smoking rates increased to 5%. For the Hmong 18 years of age and older, the rates are similar. In 1989 -- 1995, 0% smoked; and in 2006 – 2007, the smoking rate increased to 5%. In comparison, the Caucasian smoking rate decreased from 21% in 1989 -- 1995 to 16% in 2006 -- 2007 in the 18 years of age and older group. The Caucasian rate for those under 18 years of age decreased, as well, from 37% in 1989 -- 1995 to 28% in 2006 -- 2007, but remain quite high in comparison to those 18 years of age and older.

Among all of the results, the statistics show that Caucasian women have a decreased rate of smoking over time, while the Hmong women have an increased rate of smoking over time, but the Hmong still smoke at rates far below that of Caucasian pregnant women. While the rate remains low, there is a trend toward increasing smoking and likely acculturation in the Hmong. Other secular factors are at work,

showing an overall decrease in smoking in Caucasian women. We have seen a trend of increased negative behavior of perinatal smoking in Hmong, despite the fact that smoking is known to be detrimental to the health of the infant, which is assumed to be information provided to those seeking prenatal care. Prenatal care-seeking behaviors are examined later in this paper.

Alcohol Consumption

The next perinatal behavior that will be described is alcohol consumption. This data was obtained from the WIC report -- Pregnancy Nutrition Surveillance, 2006, 2007. Table 2 represents the percentages of all preconception and perinatal alcohol consumption.

Table 2

Percentages of all Pre-conception and Perinatal Alcohol Consumption

	2006		2007	
	Wisconsin	National	Wisconsin	National
3 months prior to pregnancy	12.6	9.7	10.5	7.4
Last 3 months of pregnancy	0.3	0.5	0.4	0.4

Table 2 represents the percentage of all prenatal women enrolled in Wisconsin WIC between 2006 and 2007 that reported drinking 3 months prior to pregnancy and those who reported drinking the last 3 months of pregnancy and comparing Wisconsin rates to national rates data from the Pregnancy Nutrition Surveillance reports (2006, 2007). The data demonstrate a decrease in the rates of alcohol consumption from 2006 to 2007 with the Wisconsin and national rates. Overall, the rates for Wisconsin have decreased from 2006 to 2007; although, Wisconsin remains above the national average of alcohol consumption. These statistics confirm the alcohol use problem that Wisconsin has among all ethnicities. This study does signify the need to investigate ethnic

populations and alcohol use. There exists no alcohol consumption statistics involving the Hmong prenatal population. According to Erickson et al. (1987), many prenatal behaviors, like taking medications, alcohol, and tobacco, were avoided with the Hmong; however, that was prior to years of experience in the culture. If the similar trends are true for alcohol as are true for smoking tobacco, it is important to know so further efforts can be undertaken to encourage Hmong women to maintain healthy behaviors. Although this statistics were limited, due to resources, and represents all those on Wisconsin WIC, it is a refreshing statistic representing a decrease in the negative behavior of consuming alcohol while pregnant.

Prenatal Care Utilization

Prenatal care utilization is another perinatal behavior that is important and can indicate health risks for the mother and the infant. Receiving prenatal care early has been related to improving the health of pregnant women and their infants. Table 3 represents information about prenatal care utilization among pregnant women who are Caucasian and Hmong. For this behavior, the WISH data system was accessed for information.

Table 3

Percentages of all Trimesters of Those Receiving Prenatal Care for all Age Groups

	Caucasian				Hmong			
	1st	2nd*	3rd*	None	1st	2nd*	3rd*	None
1989 -- 1995	86.0	97.0	99.0	1.0	36.0	88.0	99.0	1.0
1996 – 2000	88.0	98.0	99.5	0.5	47.0	92.0	99.7	0.3
2001 – 2005	88.0	97.0	99.5	0.5	53.0	93.0	98.0	2.0
2006 -- 2007	87.0	97.0	99.5	0.5	57.0	93.0	98.0	2.0

*Cumulative

The three trimesters are defined as; 1 -- 3 months, 4 -- 6 months, 7 -- 9 months, and no prenatal care. There is an increase in earlier prenatal care over time in the Hmong population in the first trimester, from 36% in 1989 -- 1995 to 57% in 2006 -- 2007. The majority of Hmong women seek prenatal care in the first trimester in all years, with the exception of the years 1989 -- 1995 when the second trimester was the highest. There is a slight decrease of prenatal care over time in the second trimester and a more subtle decrease for prenatal care during the third trimester, but this is due to an increase in first trimester prenatal care. This information shows that Hmong women are seeking prenatal care earlier than in the past. For Caucasian women during the first trimester, prenatal care remained the same over time, around 87%; in the second trimester, rates range from 10% to 11%; and the third trimester remained the same over time at 2%. Those receiving no prenatal care have remained stable at 0.4% to 0.5% in Caucasian women, while the rates with Hmong women ranged between 0.3% to 2% over time. The Caucasian perinatal care statistics have been remarkably stable over time.

Table 4 represents the percentage of Caucasian and Hmong women receiving prenatal care in the first trimester by age.

Table 4

Percentages of Women Receiving First Trimester Prenatal Care

	Caucasian	Hmong
<18 years of age		
1989 – 1995	62	35
1996 – 2000	65	39
2000 – 2005	67	34
2006 – 2007	63	37
≥18 years of age		
1989 – 1995	87	36
1996 – 2000	88	48
2000 – 2005	89	55
2006 – 2007	87	58

When examining the data divided by age groups, we see some similarities between the groups, despite the disparity in the rate at which first trimester care is accessed. The disparities are obvious. For those less than 18 years of age in the time frame of 1989 -- 1995, Hmong prenatal care in the first trimester was at 35%, compared to the Caucasian rate at 62%. During 1996 -- 2000, Hmong prenatal care in the first trimester increased to 39%, compared to the Caucasian rate of 65%. In the years 2001 -- 2005, Hmong prenatal care in the first trimester was 34%, compared to Caucasian women, who began at 67%. In 2006 – 2007, 37% of Hmong women began care in the first trimester, compared to Caucasian women at 63%. The trends and disparities are similar in the 18 years of age and older category, as well. Caucasian women start with rates nearly double the rate of Hmong population. In 1989 – 1995, 87% of Caucasian women sought prenatal care in the first trimester, compared to 36% of Hmong women. Similar disparities are shown in the remaining years and are seen in Table 4. The commonalities that both cultures share is that there is a difference in the age groups, with those who are older seeking early prenatal care at higher rates. There is a trend for the older Hmong women to get prenatal care earlier over time, increasing the disparity

over the younger Hmong women. Table 4 also shows there is little variance in the rates of early prenatal care for younger Hmong women. The Caucasian rates for both age groups show little variability, but the age-related differences remain with older Caucasian women seeking prenatal care earlier than younger.

Table 5 represents the percentage of Caucasian and Hmong women who are receiving prenatal care by the second, third, all trimesters and no prenatal care, by age, and includes data on the cumulative rates for each category. The cumulative rate demonstrates that between 96% and 99% of members of both cultures received some prenatal care prior to delivery. This provides information in order to look at age stratified data for women seeking prenatal care.

Table 5

Percentages of Women Receiving Prenatal Care by Trimester

	Caucasian					Hmong				
	2nd only	1st & 2nd	3rd only	2nd & 3rd	None	2nd only	1st & 2nd	3rd only	2nd & 3rd	None
<18 years										
1989 – 1995	29	91	7	98	2	50	85	13	98	2
1996 – 2000	26	91	6	97	2	50	89	10	99	1
2001 – 2005	25	92	6	97	2	54	88	11	99	1
2006 – 2007	28	91	5	96	1	52	89	9	98	2
≥18 years										
1989 – 1995	11	98	2	13	1	52	88	11	99	1
1996 – 2000	9	97	2	11	1	44	92	7	99	1
2001 – 2005	9	98	2	11	1	39	94	5	99	1
2006 – 2007	10	97	2	12	1	35	93	4	97	1

For Caucasian women under 18 years of age, cumulative rates for care received in the first and second trimesters show a consistent rate of 91% over time. The older Caucasian women received care at higher rates (97% -- 98%) in the first two trimesters. These rates are higher than the rates for the Hmong women less than 18 years of age during the first and second trimesters, who had an increase of prenatal care over time from 85% in 1989 -- 1995 to 89% in 2006 -- 2007, while in the group 18 years of age and

older, the percentage for prenatal care increased from 88% in 1989 -- 1995 to 93% in 2006 -- 2007.

The data demonstrate that older women seek prenatal care earlier. Gains in seeking prenatal care occurred primarily in older populations for the Hmong. For those 18 years of age and older in both ethnicities, there exists a decrease in late prenatal care over time. For Hmong women, the most common trimester for receiving prenatal care is the second trimester, with cumulative rates (those receiving care by the end of the second trimester) similar to Caucasian rates. This statistic is remaining stable for the younger than 18 years of age Hmong women (50%). For those 18 years of age and older, Hmong women are decreasing the overall late prenatal care and beginning prenatal care earlier.

According to Hopkins and Clarke (1983), prenatal care for the Hmong population starting at the third trimester was 35% between 1980 – 1981, compared to the national average of 5%, clearly indicating that Hmong women receive care late more often than the general population in their study. Comparing these statistics to the Wisconsin rates regarding prenatal care from 1989 through 2007, there has been a trend in the Hmong population to obtain prenatal care earlier than years prior, with the Hmong rates in the third trimester at 5% by 2001, where they remain. This is compared to the current rate in Caucasian women at 2%. Hmong women have a higher rate of receiving no prenatal care, at three to four times as many, even though the rate remains low at 2% for Hmong women. These statistics may also indicate a disparity that was present at initial arrival to the United States. Since then, the disparity level regarding prenatal care over all is decreasing, due to the Hmong perinatal women acculturating to the dominant Caucasian western cultures practices and receiving prenatal care earlier. Other reasons for the

increase in seeking prenatal care earlier may be due to the increased awareness of the service. Participation in Wisconsin WIC and other programs likely increase the awareness of the need for prenatal care and improve birth outcomes, as shown in the Madison, Wisconsin study by Schlenker and Ndiaye, (2009). In this study, infant mortality was discussed relating to Black and Caucasian infants. They found there was an increase in prenatal care utilization, which was one of the factors thought to decrease the disparities in birth outcomes for Blacks when compared to Caucasians (Schlenker & Ndiay, 2009).

Infant Outcomes

Infant outcomes are reviewed in the following section. First, a review of all births in Wisconsin provided. To put the data in context, knowledge of the total number of births is required. Data were obtained from the WISH data base. Additional data on births to Hmong and Caucasian mothers is helpful for understanding the following statistics. Presented in the following tables are the total births by years analyzed in this study and a table indicating the percentage of all births to Hmong and Caucasians. Data were obtained from the WISH data base.

Table 6

Total Number of Births by Year (1999 – 2006)

	All years	1999	2000	2001	2002	2003	2004	2005	2006
Total	1,396,881	68,181	69,289	69,012	68,510	69,999	70,130	70,934	72,302
Caucasian	1,118,550	54,813	55,381	53,969	53,798	54,831	54,217	54,292	54,525
Hmong	22,494	1,025	1,062	1,046	977	1,010	1,045	1,101	1,239

Table 6 shows a relative consistency in the number of Caucasian and Hmong births over the last 8 years. The Caucasian births represent 80% of all births, while the Hmong births represent only 1.6% of all births.

Low Birth Weight

Table 7 shows that among both ethnicities, the low birth weight (LBW) risk is increasing. For Caucasian infants, which has risen from 51 per 1,000 in 1989 -- 1995 to 62 per 1,000 in 2006 -- 2007. The Hmong infant LBW risk increased from 61 per 1,000 in 1989 -- 1995 to 70 per 1,000 in 2006 -- 2007. It is frustrating to see the LBW rate increasing over time among both ethnicities. In today's world, we have the resources and data that indicate perinatal behaviors that influence LBW, and yet, this trend continues to increase. Increasing awareness of the relationship between perinatal behaviors and how they impact infant outcomes is essential.

Table 7

Low Birth Weight (LBW) and Total Births

	Caucasian			Hmong		
	LBW	Total Births	LBW per 1,000	LBW	Total Births	LBW per 1,000
1989 – 1995	20,901	410,889	51	500	8203	61
1996 -- 2000	15,572	273,946	57	383	5,213	73
2001 – 2005	16,453	271,107	61	361	5,179	70
2006 -- 2007	6,715	109,047	62	179	2,543	70

NICU Utilization

Table 8 shows Caucasian NICU utilization was low initially at 3.7%, then increased to 5.1% in 2001 – 2005, then there was a decrease to 4.5% in 2006 -- 2007. Additional years of data are needed to determine if there is a trend up or down. The

Hmong NICU utilization has decreased over time, as well. The rate of NICU utilization in the Hmong population was 4.4% in 1989 -- 1995, remaining similar in 1996 -- 2000 at 4.5%, before dropping to 3.5% in 2001 -- 2005. Finally, in the last two years of data only (based on only 2,543 births), the rate had dropped in 2006 -- 2007 to 3.2%. The overall data suggest that the Caucasian population has a higher rate of NICU utilization compared to the Hmong population. The Hmong rate is showing declines, while the Caucasian rate is the same in 1989 -- 1995 as it was in 2006 -- 2007. A trend in the Caucasian NICU utilization cannot be determined, but 2006 -- 2007 is lower than the peak in 2001 -- 2005.

Table 8

Total Number of Infants Requiring NICU Utilization

	Total NICU	Total Births	Percent
1989 – 1995			
All	21,654	492,746	4.4
Caucasian	15,460	410,889	3.7
Hmong	256	8,203	4.4
1996 – 2000			
All	17,646	338,489	5.2
Caucasian	12,580	273,949	4.6
Hmong	234	5,213	4.5
2001 – 2005			
All	19,554	348,585	5.6
Caucasian	13,706	271,107	5.1
Hmong	181	5,179	3.5
2006 – 2007			
All	6,917	145,059	4.8
Caucasian	4,957	109,047	4.5
Hmong	83	2,543	3.2

Table 9

Comparison of Percentage of NICU Utilization

	Caucasian	Hmong
<18 years of age		
1989 – 1995	5.5	3.8
1996 – 2000	5.9	6.3
2001 – 2005	5.6	6.3
2006 -- 2007	5.1	4.5
≥18 years of age		
1989 – 1995	3.7	3.1
1996 – 2000	4.6	4.2
2001 – 2005	5.0	3.5
2006 -- 2007	4.5	3.2

Table 9 shows the NICU utilization among the Caucasian and Hmong populations divided between those less than 18 years of age and those 18 years of age and older. Overall, the percentages of NICU utilization are lower with the Hmong population compared to the Caucasian population. For those less than 18 years of age, the NICU utilization percentage among the Caucasian population is decreasing. Initially, in 1989 – 1995, NICU utilization among Caucasians was 5.5% and then increased to 5.9% in 1996 -- 2000. Since then, there has been a gradual decrease to 5.1% in 2006 -- 2007. The Hmong population shows a low percentage of 3.8% in 1989 -- 1995 and then a spike to 6.3% between 1996 -- 2005, with a decrease to 4.5% in 2006 -- 2007. Overall, both ethnicities are decreasing NICU utilization for those less than 18 years of age.

As for those 18 years of age and older, the Caucasian population had a gradual increase from 3.7% in 1989 -- 1995 to 5.0% in 2001 -- 2005, then there was a decline to 4.5% in 2006 -- 2007. The Hmong population in 1989 --1995 had the lowest percentage of 3.1%, then increased to 4.2% in 1996 – 2000. Since then, the percentages have decreased and are reported in 2006 -- 2007 at 3.2%. So the Hmong, although they

represent a recent decrease, have actually not improved since the earlier time frame, changing from 3.1% in 1989 -- 2005 to 3.2% in 2006 -- 2007.

Looking at trends over time, it appears that between 1996 -- 2000, there was a rise in all age groups, but all are decreasing when compared to the spike during those years. Perhaps this trend represents the influx of refugees between 1996 – 2000, which may have impacted the NICU utilization among the Hmong refugees. More data are needed to determine trends.

Gestational Age and Prematurity

Gestational age is an important outcome for infants. Term infants are better equipped to survive and do better developmentally, as well. Hmong and Caucasian births in Wisconsin are compared in this section. Table 10 shows the premature births of Caucasian and Hmong infants. The prematurity factor relates to gestational age. Prematurity data included infants with gestational age of 36 weeks or less. Data was obtained from the WISH data base.

Table 10

Premature Births from 1989 – 2007

	Premature Births	Total Births	Percentage
1989 – 1995			
Caucasian	33,345	410,889	8.1
Hmong	1,046	8,203	12.7
1996 – 2000			
Caucasian	25,551	273,946	9.3
Hmong	747	5,213	14.3
2001 – 2005			
Caucasian	27,783	271,107	10.2
Hmong	620	5,179	12.0
2006 – 2007			
Caucasian	11,199	109,047	10.2
Hmong	273	2,543	10.7

Table 10 shows gradual increase overtime in prematurity in the Caucasian population, from 8.1% in 1989 -- 1995 to 9.3% in 1996 -- 2000. The rate further increased to 10.2% in 2001 -- 2005 and 2006 -- 2007. The Hmong population shows an overall decrease in prematurity overtime. Initially, the Hmong population was at 12.7% in 1989 – 1995, then increased to 14.3% in 1996 -- 2000. Since this peak, Hmong prematurity rates have been decreasing, from 12% in 2001 -- 2005 to 10.7% in 2006 -- 2007. The Hmong premature births are decreasing over time and nearing the rates of the Caucasian premature births. Further analysis of trends is warranted to determine if the rates are equalizing. However, lower rates of prematurity are goals for all births.

Infant Mortality

Table 11 represents the infant mortality (rate per 1,000) of Caucasian and Hmong infants over time in Wisconsin. Mortality rates are of obvious importance, but also are known to be affected by environmental and socioeconomic factors, health behaviors, or families and communities. This data was gathered from WISH.

Table 11

Wisconsin Infant Mortality Rate per 1,000 Births

	1989 – 1995	1996 – 2002	2003 – 2008	All Years
All	7.00	5.66	5.30	6.05
Caucasian	7.00	5.66	5.30	6.03
Hmong	6.70	6.50	7.80	6.98

In Table 11, the analysis of WISH data demonstrates that the Caucasian population has a decrease in infant mortality over time. All rates are per 1,000 births. The Hmong population, initially, shows a lower rate of infant mortality than the Caucasian population. Then, the Hmong population decreased from 6.7 to 6.5, while the rate for Caucasian population rate dropped significantly to 5.6. So, while the Hmong

population decreased in infant mortality, the Caucasian population showed more gains in survival in 1996 -- 2002. During the time frame from 2003 – 2008, there was a significant increase in the Hmong infant mortality rate (from 6.5 to 7.8), along with a continued decline in the Caucasian infant mortality rate (from 5.6 to 5.3). This increase in disparity and Hmong infant mortality may be due to the new wave of refugees arriving from 2001 -- 2004. In addition, secular changes, such as the "back to sleep" campaign, occurred and are credited with the reduced infant mortality rates seen in the Caucasian (and overall) population statistics. More time is needed to know if this is a trend or if, due to low numbers of births, this is a normal variation in the data. We may be witnesses to the beginning of a disparity. This statistic should be closely examined over time.

Neonatal Mortality

When this is compared to the neonatal mortality, the rates noted for neonatal mortality show a more stable pattern in mortality during the first 28 days after life. The drop in both populations from the first time period to the second (1989 -- 1995 to 1996 -- 2002) may also be due to the "back to sleep" campaign. It is noted that for the Hmong population, there are slightly higher rates than for the Caucasian population. The trends are difficult to determine, but, while the Caucasian neonatal mortality rate is decreasing, the Hmong rate appears to be slightly increasing over time, or at least not decreasing.

Table 12

Neonatal Mortality (0 – 28 days) Rate per 1,000 Births

	1989 – 1995	1996 – 2002	2003 – 2008	All Years
All	4.35	3.80	3.58	3.94
Caucasian	4.34	3.78	3.55	3.92
Hmong	4.75	4.84	4.96	4.85

Maternal-Infant Outcome and Breastfeeding

Breastfeeding is an important behavior following birth. Breastfed infants are known to be protected from infection and have other health benefits. Breastfeeding rates for both cultures are reported in Table 13. Table 13 represents data obtained from the Wisconsin WIC report of Pregnancy Nutrition Surveillance (2006 and 2007), which identifies breastfeeding among Caucasian and Hmong women.

Table 13

Percentages of Breastfeeding by Year

	Caucasian	Hmong
1997	46	27
1998	47	23
1999	54	33
2000	58	33
2001	59	39
2002	60	42
2003		
2004	63	50
2005	63	46
2006	64	45
2007	66	50

Figure 2 shows the data from the Wisconsin WIC reports. There are increasing rates among the Hmong population in Wisconsin. Women Infants and Children represents a large portion of Hmong clients, as they are new immigrants and are known to utilize Wisconsin WIC. There is a large number of the Hmong population in this program. Data are missing from 2002 -- 2004. These were the years of transition to a new computer system for Wisconsin WIC.

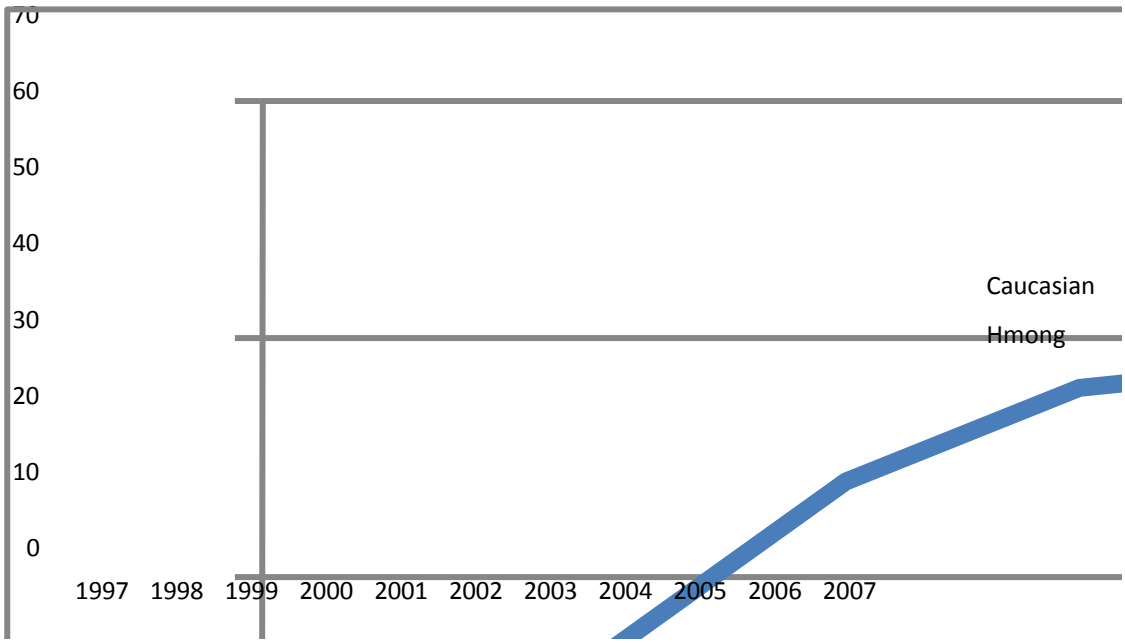


Figure 2. Percentages of Breastfeeding by Year

In Figure 2, there are missing data. The data for breastfeeding for 2003 were insufficient. The percentages were not calculated if < 100 records were available for analysis after exclusions (Pregnancy Nutrition Surveillance, 2006, p. 36, 2007, p. 30).

Table 13 and Figure 2 show that breastfeeding has increased in both cultures. The Caucasian population shows an increase from 46% in 1997 to 66% in 2007, and the Hmong population has increased from 27% in 1997 to 50% in 2007. There are trends toward increases in breastfeeding, which may be related to acculturation, and a decrease in disparities. There was known to be an initial decrease in breastfeeding, as Hmong women were given the opportunity to use formula; however, the subsequent increase over time may be related to the knowledge that this is valued behavior among health professionals and the increasing trend in the dominant culture. Education about breastfeeding as a benefit to the infant and other behaviors perinatally may help to increase breastfeeding rates.

Chapter Summary

There are several prenatal behaviors that impact birth outcomes. Tobacco smoking among the Hmong population has increased, but remains lower than for the Caucasian population. For Caucasians, that habit has decreased over the last 18 years, but is still three times or more in different age groups than it is for Hmong women. Alcohol consumption of all ethnicities prenatally has decreased between 2006 and 2007; although, Wisconsin rates remain higher than the national statistics. Unfortunately, there are no data specifically on the Hmong for this behavior. The data gathered from WISH indicate that prenatal care is increasingly being utilized, with trends toward increasing early prenatal care in both Hmong and Caucasian women. Caucasian women continue to seek early prenatal care more often than Hmong women. Despite the higher rates of smoking among Caucasians, the low birth weight for Hmong prenatal care patients is similar. Premature birth rates appear to be equalizing between the Hmong and Caucasian populations, but remain somewhat high, at just under 11%. Infant and neonatal mortality rates are somewhat higher for the Hmong population and lower for the Caucasian population. Breastfeeding has been increasing through the years among both ethnicities.

Some trends identified with the Hmong population, which may be related to acculturation, regarding prenatal behaviors include seeking prenatal care earlier, an increase in breastfeeding, and a decrease NICU utilization. Some trends discovered involving infant outcomes include infant mortality, which has increased over time. These changes may represent acculturation in both negative and positive ways. Increases in breastfeeding and early prenatal care are positive changes, while increases in smoking rates demonstrates an increase in behavior that may be the cause of rises in infant

mortality rates. There appears to be an increase in mortality rates over time for Hmong and a decrease for Caucasians, accentuating the disparity that is developing.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purposes of this study were to: (a) describe trends in behaviors of perinatal Hmong women over time and to determine if there are disparities when compared to the dominant Caucasian population, the perinatal behaviors relating to tobacco and alcohol consumption, prenatal visits, and breastfeeding; (b) describe the trends in infant outcomes over time and to determine if there are disparities when compared to the dominant Caucasian population, infant outcomes relating to NICU utilization, birth weight, gestational age, infant mortality, and neonatal mortality; and (c) determine age trends related to the perinatal behavior and infant outcomes referencing acculturation.

The research questions were:

1. What is the difference between Hmong refugees related to maternal behaviors and infant health outcomes and the dominant Caucasian culture?
2. Are there trends that can be identified in the data in light of the review of the literature that indicate an acculturation process?

The descriptive statistics were used for data analysis. The results revealed that the Hmong perinatal population appears to be acculturating by adapting to the Caucasian perinatal behaviors relating, specifically, to increased tobacco usage and are increasing in prenatal care. The alcohol rates reveal that in all ethnicities, alcohol intake did decrease within 2 years, but no data was available for the Hmong, specifically, so no conclusions about this can be drawn; although, it is an area to be studied. The results also revealed that breastfeeding behaviors are increasing, despite an initial decline due to the availability of formula through WIC. Experience of the author working in public

health prenatal care coordination encounters with the Hmong population is that, although some Hmong breastfeed, consistent with Wisconsin WIC statistics, there is a large portion of the Hmong who use formula. It is known that prior to coming to the U.S., the Hmong solely breastfeed, due to lack of formula availability. The current freedom and convenience of formula use within large families, and potential of formula as a symbol of status, encouraged the abandonment of breastfeeding in favor of bottle feeding of formula. It is thought that a higher status was assumed and that there was a general belief that if you used formula, this meant you had money (cumulative information from conversations with Hmong clients by the author). These reasons have not been shown in any study, but may be the reason why so many Hmong women continue to bottle feed their babies, in addition to the availability through WIC. The lack of hard data on breastfeeding rate change is a gap in the literature which should be explored in order to address the causal factors for low rates of breastfeeding in the future and to determine effective interventions for promoting breastfeeding. All of these prenatal behaviors influence the outcome of infant health. Healthcare providers need to be aware of the increase of acculturation among the Hmong prenatal population. In order to ensure the best health for the mothers and their babies, the healthcare provider needs to be aware of what behaviors are changing and have a plan to approach them to ensure a positive outcome.

Conclusions

Based upon the findings of this study, the following conclusions were reached:

Question 1

What is the difference between Hmong refugees related to maternal behaviors and infant health outcomes in the dominant culture?

Table 14

Differences Related to Maternal Behaviors and Infant Health Outcomes

Behavior / Outcome	Hmong	Caucasian
Smoking	Increasing, but much lower than the Caucasian population rate	Decreasing, but much higher than Hmong groups and much higher in younger populations
Breastfeeding	Lower than the Caucasian population, but increasing	Higher than the Hmong population and also increasing
Prenatal Care	Lower than Caucasian population, but early prenatal care increasing	Higher and early prenatal care also increasing
Alcohol	Needs further study, but overall decreasing rates in Wisconsin	Needs further study, but overall decreasing in Wisconsin
Prematurity	Decreasing and becoming similar to the Caucasian population rate	Increasing and becoming similar to the Hmong population rate
Low Birth Weight	Increasing and higher than the Caucasian population	Increasing but lower than Hmong population rates
NICU	Trend is unknown, but rate is lower than the Caucasian population rate	Trend is unknown, but rates are higher than the Hmong population rate
Mortality	Increasing. Initially lower than the Caucasian population, now higher than the Caucasian population rate	Decreasing and now lower than Hmong population rate

Question 2

Are there trends that can be identified in the data, and in light of the review of the literature, that indicate changes over time in Hmong perinatal behaviors and infant outcomes?

Table 15

Potential Trends Identified

Behavior	Potential Trend
Breastfeeding	Increasing
Prenatal Care	Increasing

The previous chapter reports these results in detail. Overall, the first research question can be answered by stating that the statistics from this study show that perinatal Hmong behaviors are changing, and these perinatal behaviors directly impact the infant outcomes. The second research question can be answered by explaining that the Hmong perinatal behaviors are changing with acculturation to the U.S., and with these changes, there have been infant health changes, as well. This is summarized in Tables 14 and 15.

The four perinatal behaviors of smoking, alcohol consumption, prenatal care, and breastfeeding are known to impact the five infant outcomes of birth weight, NICU utilization, prematurity/gestational age, infant mortality, and neonatal mortality. Smoking is increasing, prenatal care services are beginning sooner, and there is an increase of low birth weight and infant and neonatal mortality. It is important to watch these trends over time to determine if disparities are continuing in infant mortality. Health promotion programs should be aimed at maintaining healthy behaviors, such as abstaining from

tobacco smoking, in Hmong populations. Tobacco consumption is increasing among the Hmong perinatal population and decreasing among the Caucasian perinatal population. This may be a representation of acculturation of the Hmong population.

Alcohol consumption did decrease in 2 years among all ethnicities. This information did not differentiate ethnicity, therefore, acculturation could not be measured.

Prenatal care, initially, began late among both Caucasian and Hmong prenatal women. The statistics, as years progressed, demonstrated an increase in earlier prenatal care.

Both ethnicities continue to have an increase in low birth weights, but there is an equalizing trend in low birth weight infants.

Gestational age statistics related to prematurity show the Hmong premature birth rates are decreasing, although their numbers are higher than the Caucasian population. The Caucasian population's prematurity rates, although, they are still below the Hmong rates, are increasing. The Hmong have a higher rate of delivering before 37 weeks, compared to Caucasian women. Although the Caucasian rate of no prenatal care is 1% or less, while the Hmong population rates are stable around 2%, they both remain low. Encouragement and making healthcare more accessible are important for increasing prenatal care in the Hmong.

Smoking is decreasing in within the Caucasian population and increasing in the Hmong population, but still remain low. Encouraging not smoking at all, and especially during pregnancy, should be a focus for nurse practitioners. Increasing healthy behaviors should be a priority with all pregnant women, but may be important for this target population for health promotion programs that are culturally appropriate.

Infant death among the Hmong population is increasing and is now higher than the Caucasian population. Whether this is a trend or variation in data should be monitored. If the trend continues, further study needs to occur to determine the causes of this increase in infant mortality.

Neonatal mortality has decreased within the Caucasian population. The Hmong rate for neonatal mortality has potentially increased. It is unknown if there is a trend toward increasing numbers because of the low numbers; however, there is disparity between the two that should also be examined more closely and trends monitored over time. Action needs to be taken early if these are determined to be significant.

Breastfeeding has increased among both the Caucasian and the Hmong population. This trend should be further encouraged through promotions and increased incentives for breastfeeding.

Acculturation may be identified by the increase of perinatal behaviors affecting the infant outcomes among the Hmong women perinatally throughout the 18 year span of gathering the data. Relating to disparities, one might surmise that the longer a population is in a country, the disparities would decrease. This has shown to be true related to breastfeeding and seeking prenatal care services early; although, the data also showed negative results relating to length of time in the country (Erickson et al., 1987). Some of this data included an increase in perinatal smoking, low birth weight, and infant and neonatal mortality.

Sr. Callista Roy's Adaptation Model (McEwen & Willis, 2007; Meleis, 1997; Roy & Roberts, 1981), which portrays the four modes needed for adaptation as physiologic, self concept, role function and interdependence, is an appropriate framework for this study. The theory analysis for Sr. Callista Roy's Adaptation Model is represented as physical

response, values and morals, expectations, and relationship. Through these four modes one can observe responses and interactions with the individuals and the environment to determine adaptation. When individuals are not coping with their environmental changes it can create ineffective coping mechanisms that result in maladaptation. Therefore, the Hmong perinatal behaviors may have been influenced by their transitioning to a new country, which may have impacted their coping skills and resulted in mixed results related to perinatal behaviors but an increase in infant mortality rates over time.

Recommendations

There are several recommendations which could help to decrease disparities (goals of Healthiest Wisconsin and Healthy People 2010) and prevent the development of these disparities.

- Identify and encourage behaviors that match the Hmong cultural norm, which contribute to the health of infants.
- Make women aware of what behaviors affect the health of the infants.
- Advise Hmong women, especially teens, of their strong history of healthy behaviors that have led to healthy pregnancies and better inform them of the health choices to prevent health problems in infants.

This study also identifies that the Hmong population is acculturating to the American prenatal behaviors that are resulting in the American infant outcomes. As healthcare professionals, we need to emphasize the importance of perinatal behaviors and how they impact the infant outcomes. Education is the key to communicating the right message. When addressing any health issue with a patient, it is essential that the

interpretation of the information is clear. As healthcare professionals, having reputable interpreters is essential to communicate the accurate information. In order to obtain the Healthy People 2010 goals, healthcare professional need to provide education, encouragement, resources, and overall support to the prenatal women we serve. This will ensure the best health for the women, perinatally, and the best health outcomes for the infants for all newly arriving ethnic populations.

APPENDIX

UW Oshkosh IRB Approval

January 5, 2010

Ms. Tricia Promer
1065 Kernan Ave.
Menasha, WI 54952

Dear Ms. Promer:

On behalf of the UW Oshkosh Institutional Review Board for Protection of Human Participants (IRB), I am pleased to inform you that your application has been approved for the following research: Differences Between New and Established Refuges Related to Maternal Behaviors and Maternal/Infant Outcomes.

Your research has been categorized as NON-EXEMPT, which means it is subject to compliance with federal regulations and University policy regarding the use of human participants as described in the IRB application material. Your protocol is approved for a period of 12 months from the date of this letter. A new application must be submitted to continue this research beyond the period of approval. In addition, you must retain all records relating to this research for at least three years after the project's completion.

Please note that it is the principal investigator's responsibility to promptly report to the IRB Committee any changes in the research project, whether these changes occur prior to undertaking, or during the research. In addition, if harm or discomfort to anyone becomes apparent during the research, the principal investigator must contact the IRB Committee Chairperson. Harm or discomfort includes, but is not limited to, adverse reactions to psychology experiments, biologics, radioisotopes, labeled drugs, or to medical or other devices used. Please contact me if you have any questions (PH# 920/424-7172 or e-mail:rauscher@uwosh.edu).

Sincerely,

Dr. Frances Rauscher
IRB Chair

cc: Jill Collier
1712

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